THE LANCET.

A Journal of British and Foreign Medicine, Surgery, Obstetrics, Physiology, Chemistry, Pharmacology, Public Health, and News.

TELEGRAPHIC ADDRESS—LANCET, WESTRAND LONDON TELEPHONE NUMBER—GERRARD 5356

No. XIV. OF VOL. II., 1917.
No. 4910. Vol. CXCIII. LONDON, SATURDAY, OCTOBER 6, 1917. Price 8d.

BY C. HAMILTON WHITEFORD, M.R.C.S., L.R.C.P.

NOW READY.

ACUTE APPENDICITIS
(Practical Points from a twenty-five years' experience).
Price 4s. net.

Also,
AN OPERATING THEATRE IN PRIVATE PRACTICE
(With Illustrated Supplement). Price 3s. 6d. net.

London: Harrison & Sons, 45, Pall Mall, S.W. 1.

Now Ready. Second Edition. Enlarged. Pp. xxviii. + 492. Price 15s. net.

JUNG'S ANALYTICAL PSYCHOLOGY.
Authorised Translation, edited by Dr. CONSTANCE E. LONG.
"The work is one of the most striking and interesting contributions to the literature of the subject which has yet been published in this country."—ASYLUM NEWS
Baillière, Tindall & Cox, 8, Henrietta-st., Covent Garden, London, W.C.2.

Now Ready. Fourth Edition. Pp. xii. + 372. With 61 Illustrations.
Price 8s. 6d. net.

LAMB'S NOSE, THROAT, AND EAR.
"..... No other work covers exactly the same ground."—LANCET.
Baillière, Tindall & Cox, 8, Henrietta-st., Covent Garden, London, W.C.2.

FOURTH EDITION. JUST PUBLISHED.
8vo. Pp. 260. With 40 Illustrations. Cloth. 6s. net.

SQUINT: its Causes, Pathology and Treatment.
By CLAUD WORTH, F.R.C.S.,
Surgeon, Royal London Ophthalmic Hospital (Moorfields), &c.
Bale, Sons & Danielsson, 83, Gt. Titchfield-street, W.

BY C. MANSELL MOULLIN, M.D.Oxon., F.R.C.S., Consulting Surgeon to the London Hospital.
ENLARGEMENT OF THE PROSTATE. Fourth Edition. Price 6s.
London: H. K. Lewis & Co. Ltd., 136, Gower-street.

THE BIOLOGY OF TUMOURS, INCLUDING THE BRADSHAW LECTURE.
New and Revised Edition. Price 2s. 6d. net.
London: H. K. Lewis & Co. Ltd., 136, Gower-street, W.C.

SECOND EDITION NOW READY. Pp. iv. + 64. Price 3s. 6d. net.
INTENSIVE TREATMENT OF SYPHILIS AND LOCOMOTOR ATAXIA BY AACHEN METHODS.
By REGINALD HAYES, M.R.C.S.
THE LANCET says:—"No better exposition of the method as practised at Aachen can be found than that contained in this little work."
London: Baillière, Tindall & Cox, 8, Henrietta-street, Covent Garden.

SKIN DISEASES IN GENERAL PRACTICE:
THEIR RECOGNITION AND TREATMENT.
By HALDIN DAVIS, Captain, R.A.M.C.(T.), F.R.C.S., M.R.C.P., Assistant Physician to the Hospital for Diseases of the Skin, Blackfriars, &c.
Demy 8vo. Cloth. Pp 340. 62 Illustrations.
Seven direct colour photographs. 15s. net.
Henry Frowde and Hodder & Stoughton, Oxford Press Warehouse, Falcon-square, London, E.C. 1.

JUST PUBLISHED. SECOND EDITION. Fully Revised and Enlarged. Large 8vo. Bevelled Boards. Burnished Top. £2 2s. net. With 37 Coloured Plates and over 300 Illustrations in the Text, and a fully-detailed General Index, containing upwards of 45,000 references.
AN INDEX OF DIFFERENTIAL DIAGNOSIS OF MAIN SYMPTOMS.
Many new Articles, and new and Original Coloured Plates and Illustrations.
Edited by HERBERT FRENCH, M.A., M.D.Oxon., F.R.C.P.Lond.
TOGETHER WITH TWENTY-TWO SPECIAL CONTRIBUTORS.
Bristol: John Wright & Sons Ltd. London: Simpkin & Co. Ltd.

SAUNDERS' BOOKS FOR STUDENTS.

MACCALLUM'S PATHOLOGY.

See Saunders' Advertisement on Page 3.

Now Ready. Crown 8vo. Pp. x. + 236. Price 5s. net.
THE ORGANS of INTERNAL SECRETION:
Their Diseases and Therapeutic Application.
By IVO GEIKIE COBB, M.D., M.R.C.S. A guide to all that is of importance in the study of the Endocrine Glands
London: Baillière, Tindall & Cox, 8 Henrietta-street, Covent Garden.

Now Ready. Crown octavo. 56 pp. Illus. Price 1s. net; by post 1s. 2d.
NOTES ON MILITARY ORTHOPÆDICS.
By PAUL BERNARD ROTH, F.R.C.S. "Should be in the hands of every surgeon on active service."—MEDICAL WORLD.
Henry Kimpton, 263, High Holborn, London, W.C.

YOUNGER'S
INSANITY IN EVERYDAY PRACTICE.
"Well and clearly written, giving excellent advice as to the method of investigating any case of suspected insanity."—BRIT. MED. JOURN.
Fourth Edition. Pp. x. + 134. Price 4s. 6d. net.
Baillière, Tindall & Cox, 8, Henrietta street, Covent Garden, London.

Fourth Edition. With 22 Illustrations. Price 4s. net.
BLOMFIELD'S ANÆSTHETICS.
"A truly excellent manual."—LANCET.
London: Baillière, Tindall & Cox, 8, Henrietta-st., Covent Garden, W.C 2

Now Ready. Pp. xiv. + 277. With 90 Illustrations. Price 7s. 6d. net.
PHYSICAL REMEDIES for DISABLED SOLDIERS.
By R. FORTESCUE FOX, M.D., Honorary Medical Director of the Red Cross Clinic for the Physical Treatment of Disabled Officers.
It deals with Hydrology, Electro-therapeutics, Radiology, Mechano-therapeutics, Remedial Exercises and Training, and Medical Climatology as adapted to the Cure of the Wounded and their Re-education.
Baillière, Tindall & Cox, 8, Henrietta-st., Covent Garden, London, W.C. 2.

MENNELL'S MANUAL ON MASSAGE

MASSAGE: Its Principles and Practice. War Deformities Considered.

By JAMES B. MENNELL, M.D., B.C. Cantab., Medical Officer, Physico-Therapeutical Dept., St. Thomas's Hospital; Civilian Medical Officer in Charge of Massage Dept., Military Orthopædic Hosp., Shepherd's Bush. With an Introduction by Col. Sir ROBERT JONES, C.B., F.R.C.S., R.A.M.C.
NOW READY. Illustrated with 140 Original Photographs. 8s. 6d. net; postage 6d.
"The book appears to us to be the best on the subject for the use of medical men: it is valuable not only for what it contains but for what it suggests."—BRITISH MEDICAL JOURNAL

TEXT-BOOK OF SURGERY.
By RICHARD WARREN, M.D., M.Ch., F.R.C.S., Assistant Surgeon to London Hospital. Two Vols. 504 Illustrations. 25s. net.

SURGICAL NURSING & AFTER-TREATMENT.
By H. C. R. DARLING, M.D., M.S., F.R.C.S. 123 Illus. 8s. 6d. net.

MINOR SURGERY AND BANDAGING.
SPECIAL CHAPTER ON GUNSHOT WOUNDS. By H. MORRISTON DAVIES, F.R.C.S., Capt., R.A.M.C. (T.), Surgeon, University College Hospital.
SIXTEENTH EDITION. (HEATH & POLLARD.) 252 Illustrations. 8s. 6d. net.

SURGERY IN WAR.
By Lieut.-Col. ARTHUR J. HULL, R.A.M.C., F.R.C.S. Preface by Sir ALFRED KEOGH, G.C.B. 26 Plates. 55 Text-Figures. 10s. 6d. net.

OPERATIVE SURGERY.
By EDWARD H. TAYLOR, M.D., B.S., F.R.C.S.I., Professor of Surgery, University, Dublin. 300 Illustrations. 30s. net.

THE OPERATIONS OF SURGERY.
By ROWLANDS and TURNER, Surgeons, Guy's Hospital.
SIXTH EDITION (JACOBSON). Two Vols. 797 Illustrations. £2 10s. net.

London: J. & A. CHURCHILL, 7, Great Marlborough Street, W. 1.

THE THROAT
THE GERM
AND
THE LOZENGE

The warm moist condition of the throat being so favourable for the growth of Bacteria is a source of constant trouble to the Doctor.

He is constantly being asked, "Oh give me something to ease my throat."

Diet and treatment are necessary, but take time.

For immediate relief try "COFECTANT" LOZENGES, they are pleasant to the taste; they contain "COFECTANT," the most powerful germicidal fluid known; they are harmless and they kill germs, thereby relieving the hoarseness and soreness immediately, and leaving the Doctor to restore the patient to health in his own way and with greater comfort to both.

1/3 *Per Box from all High-class Chemists.*

EDWARD COOK & CO., LTD.,

Bow, LONDON, E. 3.

THE LANCET.

No. 4910. LONDON, SATURDAY, OCTOBER 6, 1917. Vol. CXCIII.

CONTENTS.

The whole of the literary matter in THE LANCET is copyright.

A REPORT on the Pathology, Diagnosis, and Treatment of Absolute Hysterical Deafness in Soldiers. By A. F. HURST, M.D. Oxon., F.R.C.P.Lond., Physician and Neurologist to Guy's Hospital, and Neurologist to R.V.H., Netley; Temporary Major, R.A.M.C.; and E. A. PETERS, M.D. Camb., F.R.C.S. Eng., Surgeon, Royal Ear Hospital and Aural Surgeon to R.V.H., Netley; Temporary Captain, R.A.M.C. ... 517

A COMPARATIVE STUDY of the Reactions to Human and Bovine Tuberculin Applied by the Method of Von Pirquet in Cases of Tuberculous Disease of the Bones and Joints. By H. J. GAUVAIN, M.A., B.C.Camb., M.R.C.S., L.R.C.P. Lond., Medical Superintendent of the Lord Mayor Treloar Cripples' Hospital, Alton, Hampshire ... 519

ORIGINAL ARTICLES.

The New Dietetic Treatment of Diabetes. By P. J. CAMMIDGE, M.D.Lond.—(*Illustrated*) ... 522

The Local Treatment of Meningococcus Carriers with Antiseptics. (A Report to the Medical Research Committee.) By P. FILDES, M.B., B.C. Camb., and P. B. WALLIS, B.A.Camb., M.R.C.S., L.R.C.P.Lond. ... 527

On the Closure of War Wounds in Home Hospitals. By JAMES PHILLIPS, F.R.C.S.Ed. 528

Studies in Wound Infections. On the Growth of Anaerobic Bacilli in Fluid Media under Apparently Aerobic Conditions. By S. R. DOUGLAS, M.R.C.S., L.R.C.P.Lond., A. FLEMING, M.B., B.S.Lond., F.R.C.S.Eng., and L. COLEBROOK, M.B., B.S.Lond. ... 530

An Unusual Complication of Laparotomy for Gunshot Wound. By WILLIAM H. JOHNSTON, B.A., M.D., Ch.B. 533

Inoculation Agglutinins. By I. WALKER HALL, M.D.Vict. With the Assistance of I. HILES, M.Sc., and F. NICHOLLS 534

CLINICAL NOTES:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A Case of Vincent's Infection Involving Mouth, Eyes, and Penis. By F. B. BOWMAN, M.B.Tor. ... 536

Another Case of Malaria Contracted in England. By R. LOY WILCOX, M.R.C.S., L.R.C.P.Lond. ... 536

REVIEWS AND NOTICES OF BOOKS.

The Thyroid Gland in Health and Disease. By Robert McCarrison, M.D. R.U.I., D.Sc.Belf., F.R.C.P.Lond. ... 537

Daily Drill for the Voice. By Rose I. Patry ... 537

A Farmer in Serbia. By Ellen Chivers Davies ... 538

Health Survey of New Haven ... 538

Manual of Chemistry. By W. Simon, Ph.D., M.D., and Daniel Base, Ph.D. Eleventh edition ... 538

A Laboratory Manual of Organic Chemistry for Medical Students. By M. Steel, Ph.D. 538

NEW INVENTIONS.

The "Townsend-lock" Bed Lift and Transporter.—(*Illustrated*) 538

LEADING ARTICLES

THE TREATMENT OF WOUNDS IN WAR ... 539

AIR-RAID PSYCHOLOGY AND AIR-RAID PERILS ... 540

TRAINING IN CITIZENSHIP ... 541

ANNOTATIONS.

Insincerity in Cases of War Injury ... 541

A Colour Ward ... 542

Primary Tuberculosis of the Tonsil ... 542

The Surgery of the Nose from an Æsthetic Point of View ... 542

Iritis and Optic Neuritis from Tonsillitis ... 543

Notified Venereal Disease in Christiania ... 543

The Organism of Typhus ... 544

Annual Report of the Chief Veterinary Officer for the Year 1916 ... 544

SPECIAL ARTICLES.

The Control of Venereal Diseases ... 545

Report for 1916 of the County Medical Officer of Health and School Medical Officer of London ... 548

Paris ... 548

The Services ... 552

URBAN VITAL STATISTICS:

English and Welsh Towns ... 553

Scotch Towns ... 553

Irish Towns ... 553

OBITUARY.

David Charles Rees, M.R.C.S. Eng., L.R.C.P.Lond. ... 549

THE WAR.

The Casualty List ... 549

Casualties among the Sons of Medical Men ... 549

Foreign Decorations ... 549

The Honours List ... 549

Army Medical Training in America ... 551

The National War Aims Committee's Leaflet ... 551

OBITUARY OF THE WAR:

William Duncan Kirkland, M.B., Ch.M. (Syd.), Military Cross, Major, Australian Army Medical Corps ... 550

James Ernest Studholme Wilson, M.R.C.S. Eng., Military Cross, Captain, Royal Army Medical Corps.—(*With Portrait*) ... 550

Ronald Lennox Henderson, M.B., Ch.B.Edin., Military Cross, Captain, Australian Army Medical Corps ... 550

Anthony Traill, M.B., Ch.B. Oxon., Captain, Royal Army Medical Corps.—(*With Portrait*) ... 550

Edmund Fitzgerald Bannatyne Wilson, M.D. Dub., Major, South African Medical Corps ... 550

W. R. Aspinall, M.B., Ch.M. (Syd.), Military Cross, Captain, Australian Army Medical Corps ... 551

CORRESPONDENCE.

A State-aided Midwifery Service (Dr. Lovell Drage) ... 551

Sacro-Iliac Strain (Mr. Paul Bernard Roth) ... 551

A War Memorial to Old Epsomians (Mr. Edred M. Corner) ... 552

A Case of Periodic Attacks of Pyrexia (Prof. R. Tanner Hewlett) ... 552

"Reconstruction" (Captain A. Hurrell Style, R.A.M.C.) ... 552

The Super hen ... 556

A Correction (Dr. J. Blomfield) 556

MEDICAL NEWS.

A Service of Municipal Midwives for Chelmsford ... 521

Memorial Bed to the late Mr. John Platts ... 536

Literary Intelligence ... 541

War Emergency Fund of the Royal Medical Benevolent Fund ... 541

Donations and Bequests ... 547

Victoria University of Manchester: Pass-list ... 553

Medical Society of London ... 553

North-East London Post-Graduate College ... 553

King Edward's Hospital Fund for London: Statistical Report ... 553

Medico-Legal Society: Session 1917-1918 ... 553

Presentation to a Medical Man ... 553

Doctors Called in by Midwives ... 553

University College Hospital Medical School ... 554

Imperial College of Science and Technology ... 554

Appointments ... 554

Vacancies ... 554

Births, Marriages, and Deaths ... 554

Books, &c., received ... 554

Meteorological Readings ... 554

Notes, Short Comments, and Answers to Correspondents ... 556

Medical Diary ... 556

Editorial Notices ... 556

Manager's Notices ... 556

Acknowledgments of Communications received ... 556

FOR INDEX TO ADVERTISEMENTS SEE PAGE 2.

JOHN BALE, SONS & DANIELSSON, LTD.

How to Cut the Drug Bill, or the Prescriber's Vade-Mecum. By A. H. HART, M.D. Cr. 8vo. 2s. 6d. net; postage 3d.

Tuberculosis in Children. By Prof. CORNET. Translated by J. E. BULLOCK, M.D. Roy. 8vo. 15s. net; postage 6d.

Defensive Ferments of the Animal Organisms against Substances out of Harmony with the Body, the Blood-plasma, and the Cells. Translated by J. O. GAVRONSKY, L.R.C.P., and W. F. LANCHESTER, M.A., 7s. 6d. net; postage 4d.

Local Anæsthesia: An Illustrated Text-Book for Students and Practitioners. 2nd Impression. Roy. 8vo. 8s. 6d. net; postage 6d.

Thompson's Compendium of the Pharmacopœias and Formularies (Official and Unofficial). Completely Revised. 5s. 4d. net; post free.

A Guide to the Use of Tuberculin. By ARCHER W. R. COCHRANE, M.B.Lond., and CUTHBERT A. SPRAWSON, M.D. Cr. 8vo. 5s. net; postage 4d.

First Principles in Therapeutics. By GILES FORWARD GOLDSBROUGH, M.D. Demy 8vo. 7s. 6d. net; postage 4d.

83, 85, 87, 89 & 91, GREAT TITCHFIELD ST., OXFORD ST., LONDON, W. 1.

INDEX

MEDICAL AND OTHER BOOKS AND PUBLICATIONS

PAGE

BAILLIERE, TINDALL & COX:—
Blomfield's Anæsthetics .. Cover i
Cobb—The Organs of Internal Secretion ..... Cover i
Fox—Physical Remedies for Disabled Soldiers ..... Cover i
Hayes—Intensive Treatment of Syphilis, &c. ..... Cover i
Jung's Analytical Psychology ..... Cover i
Lamb's Nose, Throat, &c .. Cover i
Younger's Insanity in Everyday Practice ..... Cover i

BALE, SONS & DANIELSSON:—
Cochrane & Sprawson—A Guide to the Use of Tuberculin 1
Cornet—Tuberculosis in Children 1
Defensive Ferments of the Animal Organisms 1
Goldsbrough—First Principles in Therapeutics 1
Hart—How to Cut the Drug Bill.. 1
Local Anæsthesia 1
Thompson's Compendium of the Pharmacopœias, &c. 1
Worth—Squint ..... Cover i

PAGE

CHURCHILL, J. & A.:—
Darling—Surgical Nursing and After-Treatment ..... Cover i
Davies—Minor Surgery and Bandaging ..... Cover i
Hull—Surgery in War .... Cover i
Mennell—Massage ..... Cover i
Rowlands and Turner—Operations of Surgery..... Cover i
Taylor—Operative Surgery Cover i
Warren—Text-Book of Surgery Cover i

FROWDE AND HODDER & STOUGHTON:—
Davis—Skin Diseases in General Practice ..... Cover i

HARRISON & SONS:—
Whiteford — Acute Appendicitis Cover i
" An Operating Theatre in Private Practice ..... Cover i

KIMPTON:—
Roth—Notes on Military Orthopædics ..... Cover i

PAGE

LEWIS & CO:—
Binnie—Manual of Operative Surgery 5
Dawson—Causation of Sex in Man 5
Elliot—Couching for Cataract 5
Elliot—Glaucoma 5
Emery—Clinical Bacteriology and Hæmatology 5
Gray—Otosclerosis 5
Hinshelwood—Congenital Word-Blindness 5
Magill—Galvanism and Faradism 5
Martindale and Westcott—The Extra Pharmacopœia 5
Moullin—Enlargement of Prostate ..... Cover i
Moullin—The Biology of Tumours Cover i
Parkes & Kenwood—Hygiene and Public Health 5
Stitt—Tropical Diseases 5

MACMILLAN & CO.—
Cohen—Organic Chemistry 4
Luciani—Human Physiology 4
New System of Gynæcology 4

PAGE

MEDICAL PUBLISHING CO.:—
Lane, Sir A.—Operative Treatment of Fractures 4

SAUNDERS COMPANY:—
Eyre—Bacteriological Technique. 3
Herrick—Neuro'ogy 3
Keefer—Military Hygiene 3
MacCallum—Pathology 3
MacCallum's Pathology .. Cover i
Mallory—Pathologic Histology .. 3
Prentiss—Embryology 3
Surgery 3

WRIGHT & SONS (BRISTOL):—
Index of Differential Diagnosis of Main Symptoms..... Cover i

MEDICAL LIBRARIES, &c.:—
Baker—Books..... 4
Behnke—Stammering, Lisping, & Cleft Palate Speech 4
Evans' Journal 22
Ketley—Stammering 4
Matthews—Wood: Application of Trusses to Hernia 4

OFFICIAL AND GENERAL ANNOUNCEMENTS

ASSISTANCIES, MEDICAL 49

ASYLUMS, HOMES &c.:—
Ashwood House, Kingswinford .. 44
Barnwood House Hospital 43
Bethel Hospital, Norwich 45
Bishopstone House, Bedford 45
Brunton House, Lancaster..... 45
Camberwell House, Peckham-road 45
Clarence Lodge, Clapham Park .. 45
Colchurst House School, Alderley Edge..... 45
Coppice, The, Nottingham 44
Court Hall, Kenton, near Exeter. 44
Dalrymple House, Rickmansworth 46
Dartmoor Sanatorium 46
David Lewis Colony, Alderley Edge..... 45
Duff House, Banff 46
General Manager, Craven-street.. 47
Ghyllwoods Sanatorium 45
Grove House, Church Stretton .. 44
Grove, The, Catton, Norwich 44
Haydock Lodge, Newton-le-Willows 45
Heigham Hall, Norwich 44
Homes for Inebriate Women 45
Littleton Hall, Brentwood..... 47
London Fever Hospital 44
Malling Place, Kent 44
Matlock Sanatorium 47
Melbourne House, Leicester..... 45
Mendip Hills Sanatorium 47
Moat House, Tamworth 44
Newmains Retreat, Lanarkshire.. 45
Nordrach-on-Dee, Banchory 48
Northumberland House, Finsbury Park 43

ASYLUMS—(Continued).
Northwoods House, Winterbourne 45
Peckham House 45
Pendyffryn Hall Sanatorium, Nordrach-in-Wales 46
Plympton House, Plympton 44
Portsmouth Corporation Mental Hospital 44
St. Andrew's Hos., Northampton. 44
Shaftesbury House, Formby-by-the-Sea 45
Springfield House Private Asylum, Bedford 44
Stretton House, Church Stretton. 44
The Grange, near Rotherham 44
Vale of Clwyd Sanatorium 46
Warneford Asylum, Oxford 43
Woodfield, Streatham 47
Wrightson, Eltham 47
Wye House, Buxton 44

FINANCIAL, &c.:—
Equitable Reversionary Interest Society 41

HEALTH RESORTS, BATHS, &c.:—
Biarritz 50
Caterham Sanitarium 47
Droitwich Brine Baths 47
Smedley's, Matlock..... 47

HOSPITAL, INFIRMARY, SANATORIUM, &c., VACANCIES.. 47-49

HOUSE & ESTATE AGENTS:—
6179, Adam street 50
CONSULTING-ROOMS"—
Garland-Smith & Co., Mount-st... 50

LIFE & FIRE ASSURANCES, &c.:—
Prudential 41

MEDICAL ACCOUNTANTS, &c.:—
Turner 50

MEDICAL AGENTS:—
Fieldhall, Limited 51
Manchester Clerical, &c., Association 51
Medical Agency..... 51
Needes, J. C. 51
Peacock & Hadley 51
Turner 51

MEDICAL SCHOOLS:—
(LONDON.)
London School of Clinical Med. .. 40
University of London, University College 40
West London Post Graduate College 40
(PROVINCIAL, &C.)
Anderson College of Medicine, Glasgow 40

NURSES' ASSOCIATIONS:—
Co-operation of Temperance Male and Female Nurses..... 42
Female Nurses Association 42
General Nursing Association 43
Hospital for Sick Children..... 43
London Nurses' Association 42
London Temperance Nurses Co-operation 43
Mental Nurses Association 42
Mental Nurses' Co-operation 43
Misses Strongwick's Nursing Agency 43

NURSES' ASSOC.—(Continued).
New Mental Nurses' Co-operation 41
Nurses' Association 42
Nurses' Co-operation 42
Registered Nurses' Society 41
St. John's House 45
St. Luke's Hospital 45
Temperance Association of Male Nurses, Ltd. 42
Temperance Male Nurses Co-operation 41
The Retreat, York 42

OFFICIAL NOTICES:—
City of London Lying-in Hospital 40
College of Preceptors 40
Incorporated Society of Trained Masseuses 40
Institute of Massage and Remedial Gymnastics 41
London School of Tropical Medicine 40
Queen Charlotte's Lying-in Hospital 40
St. John's Hospital for Diseases of the Skin 40
York road General Lying in Hospital 40

PARTNERSHIPS & PRACTICES. 49

RAILWAY & STEAMSHIP CO.'S.:—
Royal Mail Steam Packet Co. 41

TUTORS & LECTURERS:—
Medical Correspondence College. 41
Weymouth 41

TRADE AND MISCELLANEOUS ADVERTISEMENTS

AMBULANCES:—
Daimler Company—
Motor Ambulances for Hire 7
St. John Ambulance—
Invalid Carriages..... 7

BOTTLE MERCHANTS:—
Isaacs 39

CARRIAGES, MOTORS, &c.:—
Armstrong—Liveries 50
Beldam Tyre Co., Ltd.—
Bulldog Tyres 7
Deeley, Leamington Spa—Swift Car 50
Douglas Bros.—Douglas Motor-cycle 6
Morris-Cowley Cars 50
Offord & Sons—Ford Cars 7
Singer & Co., Ltd.—Singer "10" Doctor's Car 8

CHEMISTS & DRUGGISTS:—
Allen & Hanburys—
Allenburys Cod-Liver Oil, &c. .. 20
Azoule Pituitarin, &c. 19
Allenburys Castor Oil 35
Anglo French Drug Co.—
Galyl, Hectargyre 26
Antiphlogistine..... 25
Battley & Watts—
Battley's Liquors..... 9
Beghé & Chiapetta—Saurol 38
Boots Pure Drug Co.—
Oil Solution of Dichloramine-T . 12
British Oxygen Co.—Oxygen..... 35
Browning & Co.—Semprolin Emulsion with Iron..... Cover iii
Burroughs Wellcome & Co.—
Tabloid Brand Asaprin 23
Tabloid Brand Emetine Bismuthous Iodide..... Cover iv
Christy & Co.—Glyco-Hercin..... 34
Clay, Paget & Co.—Glycolactophos 52
Cook & Co.—
Cofectant Lozenges .... Cover ii

CHEMISTS—(Continued).
Duncan, Flockhart & Co.—
Organo-Therapeutical Preparations..... 18
Etablissements Poulenc Freres—
Novaline 9
Evans Sons Lescher & Webb—
Sera, Vaccines, Tuberculins, &c. 22
Fassett & Johnson—
Emol-Keleet 10
Ferber Ltd.—Blenosan Capsules.. 34
Gale & Co.—Sugonum, &c. 52
Genatosan, Ltd.—
Sanatogen..... 13
Heppells—
Urodonal, Jubol, Globeol, &c. .. 15
Hewlett & Son—
Hewlett's Specials 16
Hogg & Son—Protein Nerve Food 35
Hudson's Eumenthol Chemical Co.—Eumenthol Tooth Powder 32
Huggins & Co.—
Ozone Paper for Asthma 34
Humphrey Taylor & Co.—
Junora 52
Maltine Manufacturing Co.—
Maltine 24
Moore & Co., Ltd.—
Lymm Pure Salt 35
Parke, Davis & Co.—
Adrenalin 17
Price's Patent Candle Co., Ltd.—
Price's Night Lights 33
Raimes & Co.—Slinger's Nutrient Suppositories 36
Tidman's Sea Salt 50
Whiffen & Sons—Kinetine 35
Wilcox, Jozeau & Co.—
Nativelle's Crystallised Digitaline 32
Riodine 32

DISINFECTANTS:—
Condy's Fluid 39
Evans Sons Lescher & Webb—
Lysol Evans 22
Quibell Bros.—Kerol..... 35

FOODS—
Allen & Hanburys—
Allenburys Foods 21
Aylesbury Dairy Co.—
Humanized Milk 37
Benger's Food 14
Blatchley's Diabetic Preparations 34
Cararick & Co.—Liquid Panton Milk 21
Freemans Devonshire Custard.... 37
Glaxo 11
Hewlett & Son—Virophos 16
Hommel's Hæmatogen 10
Jardox Beef Tea 36
Thew, Hooker & Gilliey, Ltd.—
Malted Milk 37
Valentine's Meat-Juice 27
Van Abbott & Sons—Gluten Bread, &c. 37
Van Houten's Cocoa..... Cover iii

FURNITURE, &c.:—
Carters—Furniture for Invalids and Hospital Supplies..... 23

HOSIERS, &c.:—
Wolsey Underwear Co.—
Wolsey Underwear..... 28

HOSPITALS (ISOLATION):—
Humphreys, Limited—
Mobile Hospital Buildings, &c. 29

MED. & SURG. APPLIANCES:—
Bailey & Son—Bath Trusses, &c., 31
Davis—Lukens Sterile Catgut .. 8
Davis & Geck—Kalmerid Catgut . 39
Erust—Surgical and Orthopædic Appliance, &c. 33
Hearson's Specialities..... 31
McBride & Co.—Kidney and Abdominal Protector 39
Macfarlan & Co.—Surgical Catgut 38
Mimkin & Lawley—Osteology, &c. 38
Robinson & Sons—Gamgee Tissue 37
St. Dalmas & Co.—
Leicester Varico Leg Bandage .. 33
Schaarer—Dr. Allee's Bone Set .. 37

MED. APPLIANCES—(Continued).
Timpson & Co.—Ligatures 8
Wormull—System of Aluminium Splinting 38

MINERAL WATERS, &c.:—
Contrexéville Pavilion 33
Davis & Davis—Natural Mineral Waters 37

OPTICIANS:—
Watson & Sons, Ltd.—
Hæmacytometers..... 7

STATIONERY, &c.:—
City Printing and Stationery Co.—
Twinwriter Pen-Duplicate Book 39

TAILORS, BOOTMAKERS, &c.:—
Dowie & Marshall—
Hygienic Bootmakers 33
Harry Hall—Service Dress 50

VACCINE LYMPH:—
Chaumier's Calf Lymph 39
Heinemann—Rebman's Pure Aseptic Calf Lymph 39
Renner's Calf Lymph Establishment 39

WINES, BEER, SPIRITS, &c:—
Humphrey Taylor & Co.—
"G. B." Diabetes Whisky 52
Pellison Père & Co.—
Pure French Wine Brandy 52

X-RAY, &c., APPARATUS:—
Medical Supply Association—
Kompact X-Ray Installation .. 32

MISCELLANEOUS:—
Bates—Rubber Gloves Repaired, &c. 8
G., Chester-sq.—Private Secretary 49
No. 502, L.O., Strand—
Electric Light Bath 50

A Report
ON
THE PATHOLOGY, DIAGNOSIS, AND TREATMENT OF ABSOLUTE HYSTERICAL DEAFNESS IN SOLDIERS.

BY A. F. HURST, M.D. OXON., F.R.C.P.LOND.,
PHYSICIAN AND NEUROLOGIST TO GUY'S HOSPITAL, AND NEUROLOGIST TO R.V.H., NETLEY; TEMPORARY MAJOR, R.A.M.C.;
AND
E. A. PETERS, M.D. CAMB., F.R.C.S. ENG.,
SURGEON, ROYAL EAR HOSPITAL, AND AURAL SURGEON TO R.V.H., NETLEY; TEMPORARY CAPTAIN, R.A.M.C.

TWO CASES OF HYSTERICAL DEAFNESS CURED BY "OPERATION."

THE following case of hysterical deafness following shell shock was cured by "operation."

Lance-Corporal M., 26 years old, was blown up by a shell on August 29th, 1916. He became completely blind, deaf, and dumb, although he did not lose consciousness. His sight returned the following day. On reaching England he was able to read and write, and he talked in his sleep. In spite of treatment with encouragement, electricity, and etherisation, no further improvement occurred until one night in November, when he woke up and asked the sister for a drink. After this he was able to talk normally, but the deafness remained.

The patient was transferred to the Neurological Section at Netley on March 21st, 1917, seven months after the onset of deafness. He was found to be completely deaf both to air and bone conduction, though he could feel the vibration of a tuning-fork on his mastoid. A loud noise just behind his head caused a slight tremor of his hands, blinking and dilatation of the pupils, although he heard nothing; a slighter reaction was produced on the second and third occasion when the noise was repeated; after this it disappeared completely and did not return again.

The functional activity of the vestibular nerve and semicircular canals was then tested: the normal nystagmus and giddiness demonstrated that this system was unaffected. As our experience shows that organic disease or injury of sufficient intensity to produce severe cochlear deafness is invariably accompanied by loss of vestibular activity, we were assured that the internal ear was free from organic changes. This was rendered still more probable by the fact that immediately after the explosion the deafness was associated with mutism, which is always hysterical when it develops after shell shock. The patient was hypnotised by being made to stare at a lens for 15 seconds, but the deafness persisted; he could not be made to respond to any suggestion, as he was unable to hear; and a very loud noise produced no auditory motor reflex, the pupils as well as the eyelids remaining fixed.

The deafness also persisted during natural sleep, as it was found impossible to wake the patient by shouting "fire," and by banging a poker against a coal-scuttle within a few inches of his head, and no reflex contraction of his eyelids was observed. In the morning he had no recollection that anything unusual had occurred during the night. Suggestion with the aid of electricity, in which he had great belief, and attempts to re-educate the sense of hearing with various noises completely failed.

On April 16th he was told that if, in spite of the treatment he had had before and since admission, his hearing had not returned by the 20th we should have to do a small operation on his ear, which would be certain to cure him. As his hearing had not improved on the 20th he readily consented to the operation. Two small superficial incisions were made behind his ear under light etherisation and a suture was inserted. A loud noise was made during the "operation"; he heard it and jumped off the table. In the course of the next few minutes normal hearing returned in both ears to his intense delight, as he had recently become extremely depressed at the absence of any sign of improvement after seven and a half months. His hearing was accurately tested the next day, and it was found that it was perfectly normal both to air and bone conduction and the auditory motor reflexes had returned. He was discharged to duty three weeks later feeling perfectly fit. He visited the hospital on June 29th, a few days before he left for France. His hearing was normal and he was well in every way.

Another case of hysterical deafness following gun deafness was also cured by "operation."

Gunner F., aged 18, says he has been slightly deaf all his life. He became gradually deafer after gun practice whilst training in England until he could not hear at all, although he had never suffered from any definite concussion and had not served abroad. He was totally deaf to air and bone conduction, and it was impossible to wake him by the loudest noises when he was asleep. The deafness also persisted during deep hypnosis, so that he could not be made to respond to suggestion. The normal nystagmus and giddiness followed rotation, and he had a brisk auditory motor reflex both when awake and during sleep, but it was clear that this was not associated with hearing.

Ordinary persuasion, suggestion, and hypnotism having failed to produce any improvement after five months, he was advised to undergo an operation, which he was told would certainly cure him. He was given a little ether, and an incision was made behind his right ear, a plate of iron being continuously hammered at the same time. He jumped from the table in a half-drunken condition, hearing quite well, and said he must have had a dream, as he thought he had been deaf. The next day he said that he could hear better than he had ever done before. He was discharged to duty 10 days later. Two months later a report was received that his hearing remained good, he was doing his work well, and had applied for a commission.

Examination of his ears a week after the operation showed that he could only hear a 30-inch watch at 20 inches; the upper and lower limits of hearing were normal. Both drums were indrawn and showed evidence of chronic catarrh, which was doubtless the cause of his long-standing deafness. He was thus predisposed by chronic ear disease to gun-deafness, and the temporary deafness produced during gun practice was perpetuated and exaggerated by auto-suggestion. The true gun-deafness had disappeared spontaneously, so that when the total deafness resulting from suggestion was cured by suggestion in the form of an operation, his hearing returned to its original state.

ETIOLOGY.

The momentary deafness which is the natural result of the terrific noise caused by the explosion of a big shell in the immediate neighbourhood may make such an impression on the mind of a soldier that on coming to himself, whether he has actually lost consciousness or not, his first thought is for his hearing, especially if it was already impaired by preceding disease, and he may be so convinced that he is permanently deafened that he becomes actually deaf as a result of auto-suggestion.

The temporary deafness which occurs in gunners from the effect of the constant repetition of very loud noises may in the same way become perpetuated and exaggerated by auto-suggestion.

Lastly, organic deafness, especially if the onset is acute, as in that due to involvement of the auditory nerve trunk in cerebro-spinal fever, may remain complete after the disappearance of the active inflammation has been followed by restoration of some of the nerve fibres, so that a certain amount of hearing should have returned. This, again, is due to auto-suggestion, the final deafness being organic with a superadded hysterical element, which is capable of removal, like all hysterical symptoms, by suggestion.

DIAGNOSIS.

We have found it necessary to discard almost all the criteria formerly used in the diagnosis of organic deafness from deafness due to hysteria or malingering.

1. *History.*—Severe deafness following the explosion of a powerful shell is generally hysterical, though a lesser degree of organic deafness of a more or less permanent nature may be produced at the same time owing to rupture of the drum or hæmorrhage into the tympanum, which are often followed by infection of the middle ear, or to interference with the cochlear and vestibular systems probably due to infiltration-œdema or hæmorrhage into the labyrinth. It is doubtful whether absolute organic deafness ever results from hæmorrhage into the internal ear following shell shock, as no anatomical evidence of such an occurrence has yet been forthcoming. Deafness following an acute illness, especially cerebro-spinal fever, is, at any rate, always organic, but the deafness is in our experience frequently increased as a result of auto-suggestion, no functional improvement occurring when the anatomical condition improves.

2. *Bone and air conduction.*—We have employed the following quantitative tests.

(*a*) Watch test for air conduction. The distance a watch is heard (x) is expressed as a fraction of the distance at which it is heard by the normal ear (y): $\frac{x}{y}$.

(*b*) Modified Schwabach test for bone conduction. The base of a vibrating C tuning-fork is held to the base of the mastoid whilst the other hand curtains the meatus. The patient holds up his finger when the sound is no longer heard; the observer then transfers the tuning-fork to his own normal mastoid and notes the number of additional seconds during which he hears the fork.

These tests and comparison between bone and air conduction, as in Rinne's test, are, however, only of value in the slighter cases, as in many instances deafness is absolute and no hearing is possible whether the sound is conducted by bone or through the air. The vibration of a tuning-fork held on the mastoid process is often felt and the aerial vibration caused by very loud noises is often appreciated, even when no sound is heard.

3. *Auditory motor or jump reflex*.—A sudden noise normally causes an individual to jump and often to blink and the pupils dilate; the "jump," at any rate, is a protective reflex and represents the preparation for flight or fight. An officer whose left motor cortex had been almost completely destroyed went to *The Man who Stayed at Home* about four months after he was wounded. His right arm jumped violently when the gun-shot rang out on the stage, although no trace of voluntary movement returned until three months later. The efferent part of the reflex is thus subcortical.

In certain war neuroses of emotional origin in which the reflex is exaggerated jumping continues during sleep and deep hypnosis, although the patient does not hear the noise which induces it, even in a dream. The afferent part of the reflex is thus subcortical. That the reflex is quite independent of actual hearing is further shown by the fact that during deep hypnosis with the eyes open individuals in whom the reflex is normal or only slightly exaggerated do not always jump or blink and the pupils do not dilate even when a poker is banged against a shovel within a foot of the ear, although they answer even whispered questions and obey whispered commands, and the cutaneous and tendon reflexes remain unaffected. Experiments on animals by Sherrington confirm these clinical observations and indicate that the auditory motor reflex is a function of the mid-brain.

A slight reflex was present in most of our cases of hysterical deafness, but it became less marked and sometimes disappeared completely or was confined to a slight dilatation of the pupil when the test was repeated. A very nervous but totally deaf mute remained completely unmoved, never jumping or showing a flicker of his eyelid during one of the severest thunderstorms we have known, and yet the next day he was completely cured by suggestion.

It is thus clear that the presence of the auditory motor reflex does not imply that hearing occurs, and a man who says he can hear nothing but shows a normal reflex is not necessarily a malingerer, but may be suffering from genuine hysterical deafness or even organic deafness due to a bilateral lesion of the cortical auditory centres.

4. *Persistence during sleep*.—As hysterical symptoms are due to suggestion, it might be expected that they would not persist during sleep, and Babinski regards this as a definite law. Our experience agrees with his with regard to all other hysterical symptoms which we have investigated, such as paralysis, contractures, and anæsthesia, and we have seen several deaf-mutes who talked in their sleep, but we have found that hysterical deafness, the behaviour of which during sleep does not appear to have been tested by Babinski, is an exception. Thus, greatly to our surprise, we found it quite impossible to wake either of our two patients, who were suffering from total hysterical deafness, by shouting or by making other very loud noises within a foot of their heads. We convinced ourselves that deception was impossible, and the hysterical nature of the deafness in both cases was at a later date conclusively proved by their instantaneous recovery with powerful suggestion. In one patient a slight twitch of the eyelids was sometimes observed with a particularly loud noise, but not in the other. It seems probable that a malingerer could be detected by this test, as he would certainly wake if a loud noise was made when he was asleep, whereas in hysterical and organic deafness waking does not follow.

5. *Effect of hypnosis*.—We had expected that hearing would return in hysterical cases during hypnosis, but we found it quite impossible to make the patients obey any command or show any signs of hearing, and no reflex was produced, although both were deeply hypnotised on several occasions. The synapses thus appear to remain unswitched during hypnosis as they do during sleep.

6. *Change in the voice*.—It is difficult to understand why there should be any difference in the effect on the voice of total organic deafness and total hysterical deafness, as the change is simply a result of the patient's inability to hear his own voice. It is, however, a fact that we could not observe anything abnormal about the speech in any of our hysterical cases.

7. *Vestibular reaction*.—We have found that the only test upon which absolute reliance can be placed in the diagnosis of hysterical deafness from organic deafness is the presence of normal vestibular reactions in the former and their loss in the latter. The vestibular reactions are entirely beyond the control of the will, and it is therefore inconceivable that they should disappear as a result of suggestion. As hysterical symptoms are always caused by suggestion, the vestibular reactions must remain unaffected in hysterical deafness. This test has proved of great value in cases of total deafness. But it must be remembered that in partial organic deafness the vestibular reactions are lost in the severer cases and exaggerated in the slighter cases, and the organic deafness may be accompanied and exaggerated by the simultaneous presence of hysterical deafness, which it is quite impossible to recognise except by the improvement which follows treatment by suggestion. The vestibular reactions may be investigated by the rotation, caloric, or electric tests, in all of which nystagmus and giddiness occur in normal individuals, but not if the vestibular nerves are involved. We have employed the rotation test for our cases, the patient being tied into an arm-chair, which is rotated ten times in 10 seconds.

PATHOGENESIS.

Hearing necessitates listening. Inattention during a dull sermon results in total deafness to the sermon, and in hysterical deafness the patient is so convinced that he cannot hear that he does not listen. Although the sound vibrations reach the ear in the normal way, they do not give rise to the slightest auditory sensation because of this inattention. The synapses at one or more of the cell stations in the auditory path to the cerebral cortex must, therefore, be unswitched, probably as a result of retraction of the dendrons. In absolute hysterical deafness the auditory motor reflex, which is a function of the mid-brain, may be abolished or greatly diminished. One of the unswitched synapses must, therefore, be below the mid-brain and either in the auditory nucleus or less probably in one of the intermediate cell stations—the superior olive or the nucleus of the lateral fillet.

The persistence of the deafness during hypnosis and natural sleep shows that during the prolonged inattention of hysterical deafness which has lasted for a considerable period the unswitching of the synapses is more profound than that which normally occurs during deep sleep, in which the synapses can always be forced by a loud noise.

TREATMENT.

Deaf-mutism.

Uncomplicated deafness is the most difficult of all hysterical symptoms to treat; mutism is one of the easiest. It is therefore fortunate that most cases of hysterical deafness are associated with mutism, as the return of speech in a deaf-mute generally convinces him that he can also hear, especially if he has been told that this will be the case. He listens as soon as he finds he can speak, and the unswitched synapses are once more switched on.

Among the numerous cases of deaf-mutism observed by one of us (A. F. H.) rapid recovery always occurred, sometimes spontaneously as a result of various accidental circumstances and sometimes as a result of various methods of treatment. One man was sleeping when his parents came to visit him a fortnight after he had become dumb as a result of shell shock. They woke him up, and he at once said, "Hullo,

mother." Another recovered after a cold douche as he was getting out of a hot bath. The majority of deaf-mutes who required treatment were cured by the introduction of an intralaryngeal electrode, generally before the current was switched on, after having been told that this would cure them at once. With the aid of vigorous persuasion this method of suggestion is nearly always effective. At least one man has recovered when drunk and numerous others under anæsthesia. Sufficient ether should be given to make the patient excited, and vigorous suggestion and persuasion must then be used until the patient has completely regained consciousness.

Uncomplicated Deafness.

We have only seen two cases of absolute hysterical deafness without mutism, and in one of them mutism was originally present, but spontaneous recovery had occurred some months earlier. Both cases had had various forms of treatment before we saw them. Simple encouragement and the promise of recovery had proved unavailing, and when we repeated the promise to a man who was still completely deaf after eight months, he not unnaturally received our promise with considerable scepticism. We tried the effect of making very loud noises of different kinds near the patients' ears in the hope that they might break through the resistance, and that when they were heard, re-education with other sounds could be begun. But this method, which is sometimes successful in the partially deaf, was unavailing, as the deafness was absolute, and no noise, however loud, was heard. On many occasions the patients themselves shouted as loudly as they could through the chest-piece of a binaural stethoscope, the ear-piece of which was in their own ears, and at other times the chest-piece was put on an iron plate, which was then hammered, but they heard nothing. Etherisation had been tried without success before we saw them. Various forms of suggestion were tried; one patient had a great belief in electricity, but although we encouraged him to believe it would cure him, it had no effect. Both patients were hypnotised on a number of occasions without difficulty, but this proved useless, as the deafness persisted, and they could not be made to obey any commands which other hypnotised individuals obey immediately, so that suggestions of recovery which are effective in patients suffering from incomplete hysterical deafness naturally gave no result; other loud noises and familiar tunes from a gramophone placed in contact with the ear during hypnosis had no more effect than shouting, and as the deafness persisted during sleep it was impossible to cure the patients by suddenly exciting them during the night.

As all treatment had failed, we told the more intelligent of the two patients that if he did not get well in the next week we would be compelled to advise him to undergo an operation, which we had wished to avoid, but which was quite certain to cure him. He was no better at the end of the week, and was eager to have the operation. He was given enough ether to make him excited, and two small cuts were then made behind his ear; a hammer was banged on a sheet of iron during the "operation," and the moment after the incision had been made the patient jumped off the table with his hearing restored. The other patient was unwilling at first to undergo an operation, but finally consented, as he was naturally impressed by the recovery of the first patient, who was in the same ward and had been deaf for a much longer period. The same "operation" was performed and complete recovery occurred in exactly the same way. The joy shown by both patients on their recovery whilst in the theatre, and on return to the ward was so obviously genuine that there could be no possible question about the genuineness of the deafness; at one time we had been rather doubtful about the second patient, but fuller investigation had convinced us more than a fortnight before that he was not malingering.

CONCLUSIONS.

We are convinced from our experience in these cases that absolute deafness associated with normal vestibular reactions should be regarded as hysterical, and when simple encouragement fails, as will generally be the case if the patient is not also dumb, an "operation" should be performed in the way we have described, after the patient has been made to feel quite confident that it will restore his hearing.

A Comparative Study

OF

THE REACTIONS TO HUMAN AND BOVINE TUBERCULIN APPLIED BY THE METHOD OF VON PIRQUET

IN CASES OF TUBERCULOUS DISEASE OF THE BONES AND JOINTS.[1]

BY H. J. GAUVAIN, M.A., B.C. CAMB., M.R.C.S., L.R.C.P. LOND.,

MEDICAL SUPERINTENDENT OF THE LORD MAYOR TRELOAR CRIPPLES' HOSPITAL, ALTON, HAMPSHIRE.

THE work here reported was done for the Local Government Board concurrently with their investigation into the types of tubercle bacilli occurring in tuberculous bones or joints.[2]

In aid of the latter inquiry I sent for examination in the Board's Pathological Laboratory material from abscesses or sinuses occurring in 116 children[3] who were affected with tuberculous bone or joint disease and were patients in the Lord Mayor Treloar Cripples' Hospital at Alton. In discussions which I had with the Board's pathologists, Dr. A. Eastwood and Dr. F. Griffith, it occurred to us that, having these cases under observation, it would be a matter of interest and some practical importance to undertake a quantitative investigation of the von Pirquet cutaneous test on such of these patients as were available, to check the reactions by colour photographs and to endeavour to ascertain:—

1. Whether the reaction to cutaneous inoculations of tuberculin was constantly present in patients suffering from undoubted tuberculous lesions of the bones or joints—that is, in patients from whose lesions the tubercle bacilli had been isolated.

2. If not constantly present, under what circumstances the reaction would not appear.

3. Whether by using both human and bovine tuberculin for the von Pirquet test it would be possible to ascertain, from the reaction which followed, whether the patient was suffering from tuberculosis of human or bovine origin.

4. Whether the degree of reaction gave any indication of the severity of infection.

5. The extent and nature of the reaction.

These suggestions were submitted to the Board and received their approval. Accordingly, with the aid of a grant from them, I carried out the proposed work during the autumn of 1914, with the assistance of Mrs. Gauvain, who took colour photographs of the reactions obtained.

I applied the von Pirquet test to 80 out of the above 116 cases. In order to avoid any risk of unconscious bias I made the inoculations and recorded their results without knowledge of bacteriological reports as to the type of bacillus found.

The tuberculins employed were Koch's "old tuberculin," prepared from the "human" type of bacilli, and his tuberculin prepared in identical way from bacilli of bovine origin. These were supplied by Messrs. Meister, Lucius, and Bruning, of 3, Jewry-street, E.C., who certified as to their purity and efficiency.

Technique of Operation and Precautions Employed.

The tuberculins were applied to suitable skin scarifications in dilutions of 1 64, 1 16, 1 4, and in full strength, each in approximately equal bulk and controlled by inoculation of a scarification with the same quantity of sterile normal saline solution.

In the majority of cases the scarifications were made on the anterior surfaces of both thighs; where the legs were not available both arms were used. In every case a minimum distance of at least two inches existed between

[1] With the aid of a grant from the Local Government Board.

[2] A. Eastwood and F. Griffith: "The Characteristics of Tubercle Bacilli in Human Bone and Joint Tuberculosis," Journal of Hygiene, vol. xii., No. 2, Jan. 14th, 1916.

[3] In 11 of these cases tubercle bacilli were not obtained in culture; of the rest, 70 yielded bacilli of "human type," 32 "bovine" bacilli, and 3 atypical strains of tubercle bacilli.

any one scarification and its nearest fellow, so that adjacent reactions should not become confluent.

To minimise the possibility of tuberculin applied to one scarification being conveyed by the lymphatic channels to a neighbouring scarification which had been treated with a weaker solution of tuberculin the solutions, commencing with the control, were applied to the scarifications in order of increasing strength from the distal to the proximal extremity of each limb.

Human tuberculin was always applied to scarifications on the right side of the body and bovine tuberculin to scarifications on the left side.

To ensure the scarifications being as nearly as possible equal, the same von Pirquet scarifier, supplied by Messrs. Allen and Hanburys, was in every case used. This instrument may be quickly and conveniently sterilised by passing through the flame.

The control solution and the tuberculins were all applied to the scarification marks with sterile glass eye-rods of the same size, a separate rod being kept in each bottle. In this way approximately the same quantity of liquid was applied to the centre of each scar. The solution was simply placed on the scar, not rubbed in.

The bottles containing the solutions of tuberculin were all placed on one tray in ascending order of strength. On the right-hand side of the tray was the human tuberculin, on the left the bovine. In the middle was the bottle containing the control solution. The bottles had distinguishing coloured labels as a further safeguard against the possibility of introducing the wrong solution into the various scarifications.

The test was conducted as follows:—

The scarifier was first sterilised in the flame and the skin over the area on both limbs to be scarified cleansed with ether. The tip of the scarifier was then placed on the skin, the instrument being held vertically, and the scarification was performed by the exercise of firm but gentle pressure while rotating the scarifier between the finger and thumb about half-a-dozen times. The outer layer of the skin over a minute circular area was thus removed and the vascular subcuticular layer brought to view. It was found quite unnecessary to continue the pressure long enough to cause any bleeding.

The five scarifications were thus rapidly made on each of the two selected limbs at approximately the same level on both sides and in the same situation. The control saline was then applied to each of the most distal scarifications, the human tuberculin in increasing strength to the succeeding scarifications up the right side, the bovine similarly up the left. The limbs were kept uncovered until the liquid applied had dried. No dressing was employed, and the limbs, when dry, were simply covered with bedclothes in the ordinary way.

Local Reactions.

In no case did either variety of tuberculin fail to react. The degree and extent of the reaction varied within wide limits, and its persistence was also variable; but the response of every case to both tuberculins was particularly noteworthy. In the majority of cases reaction was clearly visible within 24 hours, and often could be observed within 12 hours. It usually reached its maximum at between 36 and 48 hours, and then gradually faded. Frequently the reaction of the quarter and full strength tuberculins remained well marked for a week or longer. In exceptional cases the reaction persisted for a month or more, and in one case (E. M., No. 89) who was inoculated on Nov. 26th, 1914, the reaction was still clearly visible on March 11th, 1915.

In each case the controls were negative. After two or three days the scars which had received the control solution became invisible, except on close search.

At this period, even when no definite reaction could be distinguished in the scarifications treated with the lower two dilutions of the tuberculin, the scars made would usually persist. Sometimes, though no colour change round these scars could be seen, passage of the finger over the scars gave the sensation of a small but definite papule depressed in the centre.

In patients not the subject of tuberculous disease this retardation of healing of the scar, to which diluted tuberculin had been applied, did not appear to exist. This observation was only made on a few subjects, as suitable non-tuberculous subjects of the age of the patients tested were not readily available. If, however, this observation stands the test of further investigation it would afford the suggestion that delayed healing in a scar to which diluted tuberculin had been applied, even in the absence of colour change and without palpable raising of the edge of the scar, is in itself evidence of a minimum degree of a positive reaction to the von Pirquet test.

Next in order of intensity were the reactions where there appeared a circumferential reddening of the skin about the crateriform depression made by the scarifier; this reddening varied from the merest line in some cases to a total circumference of about an inch or more in others. The outer edge of this area was quite distinct and the colour was of almost equal intensity, though perhaps not quite so marked at the periphery. The shape was sometimes irregular, but more usually circular or somewhat oval.

In reactions of greater severity than the last an outer halo of faintly red discolouration was distinctly visible, much less intense than the inner red area and of varying size, though rarely extending for more than a quarter of an inch from the central denser area, except where it tapered out into a filamentous projection or projections which marked the radiation of a lymphatic channel.

Finally, when the reaction was most intense the marked red area immediately about the scar became paler and more livid adjacent to the crater and sometimes assumed a purplish hue. This appearance marked the maximum reaction noted. It was characterised by four distinct zones—a depressed scar in the centre, bordering this a livid pink or purplish zone, surrounding the latter a well-marked zone of intense redness, and, embracing the last, a faintly pinkish area, the outer limit of which was indefinite and merged into the surrounding skin, being sometimes prolonged for a shorter or longer distance into radiating lymphatics.

As was to be expected, the degree of reaction generally varied with the strength of solution of tuberculin, stronger solutions provoking a more intense reaction than weaker. In some cases, however, particularly when inoculations were made on the thighs, the difference between reactions of a quarter and full strength were not marked, and occasionally the quarter strength solution appeared to cause a more intense reaction than the full strength. This may possibly be partly accounted for by accidental inequality in the degree of scarification. It was found that on approaching the groin the skin was less tense and rested on a less firm foundation than on the middle region of the thigh. With equal pressure the scar made by the scarifier in the groin region did not penetrate so deeply in the looser skin as the scar made on the firmer skin in the middle of the thigh.

Hence it is conceivably possible that a weaker solution of tuberculin inoculated into the skin of the middle of the thigh might cause a greater reaction than a stronger solution inoculated into the skin of the groin.

General Reaction.

To ascertain if any general reaction followed the employment of this test the temperature in each of the cases investigated was taken every two hours for the first 48 hours and every four hours for the succeeding 48 hours; subsequently the usual morning and evening temperatures were alone taken, unless for any reason it was found desirable to take the temperature more frequently. Subjective symptoms were also very carefully noted.

In the great majority of cases, except for a fractional rise of temperature, there was no evidence of any general reaction whatever. Often not even a slight rise of temperature was observed.[1]

In six cases only did the temperature rise up to or above 100° F. where the raised temperature could be ascribed to the test. This rise was always on the day succeeding the inoculation. In three of these cases the patients complained of headache and general malaise. These symptoms always rapidly disappeared, and in only one case did the headache persist throughout the day following the inoculation.

General reaction, when present, was only noticeable on the day succeeding the application of the test.

In one (R. T., No. 74) of these six the temperature rose to 100° F. on the afternoon succeeding the day of inoculation, and the patient complained of slight headache.

In another case (N. R., No. 80) the temperature rose to 101·4° F. on the afternoon following the day of inoculation. Patient looked flushed, complained of headache, and vomited undigested food once.

In the case where the general reaction was most marked (M. B., No. 9) the test was applied at 7 P.M. on August 26th,

[1] Care was taken, where possible, to test only apyrexial patients. In very few cases was there any pyrexia due to complicating sepsis or other cause.

1914. The next morning the patient looked ill, the eyes were sunken, face drawn and flushed, and the child was very quiet. There was slight erythema on the chest, abdomen, and back; the temperature was 100·5° F., and the patient complained of feeling ill and having headache. At 3 P.M. the temperature was 103·4°, cheeks more flushed, headache intense, and patient drowsy. In the evening the temperature went down, the headache was relieved, and the rash disappeared. The patient slept well at night, and the next morning he was bright, lively, with no headache and no discomfort; his temperature was normal and he appeared quite well.

In this patient the local reaction was more intense than in any of the others in the whole series. He was a fair-skinned, red-haired boy. It is probable that these symptoms were not the result of the test but due to other and unascertained causes. This was the only case in which the general reaction could be called severe.

In the remaining three cases a temperature rising to 100° F. was alone noted. In no case did the general reaction extend beyond the day following the inoculation.

It should be remembered that the patients tested were children and not able to describe symptoms clearly; but they were kept in bed under close observation, and no evidence could be found of general reaction more intense than stated above.

In no cases were any ill-effects observed other than the transient ones exceptionally occurring and already recorded, and these apparently need not be anticipated if not commencing within 24 hours of the inoculation.

Local Reactions to Human and Bovine Tuberculin.

The local reactions to human and bovine tuberculin were found to be essentially similar, and, without the knowledge that the one tuberculin was always inoculated on the right side and the other on the left, it would have been impossible to decide whether any one reaction was due to human or bovine tuberculin.

While variations in the degree of the local reactions between one patient and another were frequently marked, it was the exception to find considerable variation in degree between the reactions to human and bovine tuberculin in any one patient. Out of the 80 cases investigated in 23 the reactions to human and bovine tuberculin were so nearly equal that it was impossible to decide which was the greater. In 21 cases the reaction to human tuberculin was slightly greater than to bovine. In 25 cases the reaction to bovine tuberculin was slightly more marked than to human. In four cases the reaction to human tuberculin was markedly greater than to bovine. In seven cases the bovine reaction was markedly greater than the human. (See Table.)

Comparison of Results obtained by Von Pirquet Test with Bacteriological Findings.

Reactions.	No. of cases.	Bacteriological findings.			
		Human.	Bovine.	Atypical.	Negative
Approximately equal	23	16	5	1	1
Slightly greater to human tuberculin	21	13	8	—	—
Slightly greater to bovine tuberculin	25	14	6	1	4
Markedly greater to human tuberculin	4	2	1	—	1
Markedly greater to bovine tuberculin	7	5	2	—	—
Totals	80	50	22	2	6

Relation of Degree of Reaction and Severity of Disease.

No definite relationship could be established between the degree of the reaction and the severity of the disease.

Thus, G. D., No. 1, suffering from severe dorso-lumbar caries with sinuses, reacted but feebly, while L. G., No. 60, suffering from an approximately similar condition, reacted well.

G. L., No. 50, suffering from very severe tuberculous disease of both hip-joints, with a sinus in connexion with the right hip, reacted very feebly; but M. B., No. 9, suffering from similar lesions of almost equal severity, reacted intensely.

Again, G. P., No. 58, suffering from tuberculous disease of the knee-joint of moderate severity, reacted well; but H. M., No. 62, suffering from a similar but much more severe lesion, reacted feebly. And similarly with other cases.

I have formed the impression that patients who are weakly and cachectic, irrespective of the severity of the local lesions, tend to react feebly, whereas patients who are strong and vigorous, whether their local lesions be severe or slight, may show either an intense or mild reaction to the von Pirquet test.

Progressive disappearance of the reaction from the 1/64 scar upwards did not indicate diminished activity of the disease. No guide to prognosis could be found by comparing the reactions produced by the weaker and the stronger applications of tuberculin in the same patient.

Since this investigation was undertaken a sufficient interval has elapsed to estimate with some degree of accuracy the prognostic value of the quantitative von Pirquet test. As might be anticipated, the weakly and cachectic patients have not made such substantial or rapid progress towards recovery as the strong and vigorous ones. Yet the reactions obtained in the latter were more intense than those in the former. Where weak solutions as well as concentrated solutions give marked reactions the only inference which I could draw was that the patient had abundant reacting power.

One of the most marked reactions to all strengths of tuberculin, both human and bovine, occurred in a strong, vigorous, and well-nourished girl apparently in robust health but with a bad tuberculous family history, and who had been long exposed to danger of infection. In this patient I could detect no clinical or radiographic evidence of disease, though, doubtless, she was infected.

On the other hand, patients with severe lesions with progressive disease often reacted feebly. The reaction to inoculation was therefore rather a measure of the degree of resistance of the patient than of the severity of the infection.

Results of Investigation.

The final result of the investigation may be stated briefly as follows:—

1. Local reactions to inoculations of both human and bovine tuberculin were invariably present in all patients from whose pus tubercle bacilli had been isolated.

2. Though reactions were invariably present the degree of reaction varied within wide limits.

3 Weakly and cachectic patients usually reacted feebly, quite irrespective of differences in the severity of their local lesions.

4. Strong and vigorous patients exhibited wide differences in the degree of their reactions, irrespective of differences in the extent or the severity of their local lesions.

5. The quantitative von Pirquet test was not found to be of value in forming an estimate of the severity of the infection, and was of little prognostic value.

6. It was impossible to differentiate the type of tubercle bacillus with which the patient was attacked by the nature of the reaction to the tuberculin employed.

To the Honorary Medical Board of this hospital I wish to record my thanks for so readily consenting to this investigation being undertaken, and for much encouragement given and interest displayed in the progress of the research.

I desire to express my grateful thanks for invaluable assistance afforded by Dr. Eastwood, both in suggesting the most useful lines on which this investigation should proceed and in giving material and helpful criticism on the interpretation of the observations made. To my wife I am also deeply indebted for the colour photographs she took of the reactions produced, which form a permanent record of great value and afforded a useful check and supplement to direct observations made at the bedside.

A SERVICE OF MUNICIPAL MIDWIVES FOR CHELMSFORD.—In consequence of having to look after the practices of colleagues on war service the remaining doctors in Chelmsford have notified to the medical officer of health their inability to attend maternity cases. The circumstances were brought before the town council by the medical officer of health as a matter of urgency, and attention was drawn to the difficulties likely to arise in the town with its annual total of births between 400 and 500. Only three certified midwives are working in the borough, and the remaining medical men suggested that the difficulty should be solved by the appointment on the part of the council of two certified midwives to assist the local medical service. The Local Government Board had assented to the suggestion and agreed to pay one-half of the cost incurred by the council. After discussion *in camerâ* the council authorised the medical officer of health to select two midwives at a minimum salary of £75 each, on the understanding that the arrangement was to last only for the duration of the war and three months after.

THE NEW DIETETIC TREATMENT OF DIABETES.[1]

BY P. J. CAMMIDGE, M.D. LOND.

Treatment by Fasting.

IT is now many years since it was first suggested that patients suffering from severe diabetes should be starved until their urine became sugar-free, but the suggestion was not generally adopted, as it was found that an alarming increase in the excretion of acetone bodies often occurred when the fasting had proceeded for a short time. Acting on the experience gained with animals rendered more or less diabetic by partial removal of the pancreas, Allen gave a further trial to the method and found that, in the majority of cases, the acidosis which is apt to develop during the first few days of starvation subsides afterwards if the fasting is persevered with. As a result he formulated a plan of treatment which may be summarised briefly as follows:—

1. A preliminary fast is given until the urine is free from sugar.
2. When it has been sugar-free for 24 hours carbohydrate food is allowed in gradually increasing amounts, starting with green vegetables.
3. Coincident with the addition of carbohydrate, or in place of it if the carbohydrate tolerance is very low, protein is introduced into the diet, in small but gradually increasing quantities, until glycosuria occurs, or a sufficient amount is being taken to cover the basal requirement of the patient.
4. Fat is added to the diet in small quantities during the time the carbohydrate and protein tolerance are being tested, and is subsequently increased more rapidly until the fuel requirements of the body are met, provided that glycosuria does not develop and there is no increase in the acidosis.
5. The appearance of sugar in the urine at any time is taken as an indication that a fast of sufficient length to cause a cessation of the glycosuria is necessary.
6. A diet containing not more than half the carbohydrate being taken at the time sugar appears is then continued with for some weeks. Later further additions are made very gradually.
7. At intervals, depending on the severity of the case, the patient fasts, or greatly restricts the whole level of his diet, for 24 hours.
8. Adult patients are not allowed to gain in weight, but a natural increase is allowed in children, although care is taken that the gain should not be in adipose tissue.
9. Active daily exercise, carried to the point of healthy fatigue, is insisted on in all cases if possible.

The details of the method necessarily vary somewhat according to the character of the case, as Allen himself has pointed out, although few of his disciples seem to be aware of the fact. I do not propose to consider them here, however, but shall devote my attention mainly to the metabolic changes produced by the treatment and its effect on different types of glycosuria.

Chronic Intestinal Catarrh.

Everyone who has had more than a very limited experience of the condition to which the name diabetes mellitus is generally applied cannot avoid coming to the conclusion that it occurs in a variety of forms, with the one symptom of glycosuria in common, but differing widely in other respects. This variation is even more marked when the blood, urine, and fæces of a number of cases are systematically investigated and compared. During the last few years I have had the opportunity of making analyses of some 8,000 specimens from over 500 cases of diabetes, including 54 whom I have treated by Allen's method. One of the most striking results of my investigations has been the frequency with which indications of a chronic catarrh of the upper part of the intestinal tract have been met with, such a condition being present in 71 per cent. of my cases. One can hardly assume that the relationship is accidental, or that the catarrh is a secondary phenomenon, for the history very frequently shows that heartburn, flatulency, and other symptoms of indigestion preceded the discovery of sugar in the urine, often by several years, while I have found that treatment directed to the intestinal condition frequently helps to control the glycosuria, whereas reappearance or accentuation of the catarrh may be followed by increase in the sugar excretion. Cases of this description generally respond well to alimentary rest, but they are liable to relapse unless the intestinal condition is considered in the subsequent treatment.

The fasting treatment is based on the assumption that impairment of the functions of the pancreas is the cause of glycosuria in all cases, and that the improvement in carbohydrate metabolism which results is due to the physiological rest given to the gland. Although this may be true to some extent in cases with a chronic intestinal catarrh, it is probable that the starvation also has an effect on the intestinal condition, and that this helps to control the glycosuria. It may be a de-intoxicating process, as Guelpa supposed, but as Lombroso has recently shown that the intestine yields a glycolytic agent to the blood even more readily than the pancreas, it is possible that the physiological rest may influence the production of this substance, and so improve the utilisation of sugar. At any rate, the analogy between the diabetes produced in animals by partial extirpation of the pancreas and in the human subject is probably not always as close as there has been a tendency to assume, since on the one hand we are dealing with a surgical mutilation of a non-progressive character, whereas on the other we have to treat a pathological state that tends to progress, and, even when checked, to recur.

I could quote a number of cases to illustrate the relationship between the condition of the intestine and the progress of diabetes, but one will suffice:—

A lady, 26 years of age, was sent to me at the beginning of August, 1916, with the history that a month before she had begun to feel thirsty and was easily tired. As the symptoms increased she saw her doctor, who found sugar in her urine, and wrote to me for an appointment. When she came I examined her blood and found 0·23 per cent. of sugar, while a specimen of urine she brought with her contained 6·2 per cent., giving a total excretion for the 24 hours of 124 gm. Later, on a test diet containing 3½ oz. of bread and with a total carbohydrate content of 70 gm., she passed 52 gm. of sugar in the 24 hours. The urine also contained 300 mg. of acetone bodies, but no oxybutyric acid, 760 mg. of ammonia nitrogen, 450 mg. of calcium, 230 mg. of magnesium, and showed a normal creatinine and uric acid excretion, and a normal nitrogen balance. There was a very marked reaction for indican, which worked out quantitatively at 123 mg. The fæces were dark brown in colour, rather soft in consistency, acid in reaction, and gave a very marked reaction for biliverdin, but contained no occult blood. The trypsin index was slightly subnormal, 200 units, but there was no evidence of serious interference with fat digestion or absorption.

This patient was not starved, as the glycosuria and hyperglycæmia quickly cleared when the carbohydrate intake was limited, and means were taken to combat the intestinal condition. As the latter improved the diet was gradually increased, until ultimately 70 gm. of carbohydrate were again being taken, but without there being any sugar in the urine. The main interest of the case lies in the fact that the patient had consulted me two years previously for chronic indigestion, when there was no trace of glycosuria. Her urine then contained a marked excess of indican, 188 mg., there was a high iodine coefficient ("pancreatic reaction") of 248 units, and an abnormal amylolytic ferment index of 67 units. The fæces were at that time strongly acid in reaction, contained a considerable amount of unchanged bile pigment, and gave an abnormally high trypsin index of 5000 units. Quantitative analysis showed a relative excess of combined fatty acids and a very low proportion of neutral fat. There was evidently, then, very considerable catarrh of the upper part of the intestinal tract, with secondary catarrhal pancreatitis, and in a letter to the patient's doctor I pointed out the possibility of diabetes supervening if the condition progressed, as, unfortunately, it appears to have done. (Chart 1.)

Classification.

It is comparatively uncommon, in my experience, to find evidence in the urine and fæces of advanced cirrhosis of the pancreas in diabetics. As a rule a cirrhotic, or malignant, pancreas is associated with only traces of sugar, 5 gm., or less, in the 24 hours, and it is rare also to meet with acetone or signs of acidosis, even when, as occurs exceptionally, the sugar excretion rises to 50 or 100 gm. a day.

Signs of some interference with the digestive functions of the pancreas were found, however, in the majority of my cases (72 per cent.), and in most of them (67 per cent.) there were indications that the functions of the liver were also being imperfectly carried out. In some 27 per cent. the hepatic disturbance was apparently more pronounced than the pancreatic.

It is consequently convenient to recognise three types: (1) the pancreatic, (2) the hepatic, and (3) the pancreo-hepatic—a classification I find of considerable help in prognosis and treatment.

[1] A paper read before the Harveian Society on April 19th, 1917.

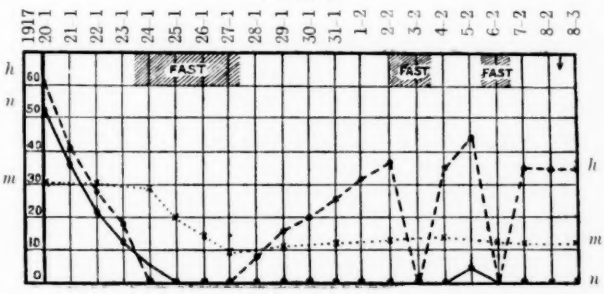
The outlook for patients with a cirrhotic pancreas is usually fairly good, provided that a suitable diet is arranged as soon as possible after the discovery of the disease. I have not found that they are materially benefited by the starvation treatment, and, as their digestive powers for all three classes of foodstuffs are deficient, the indications are rather to ensure sufficient nourishment than to worry unduly over the comparatively unimportant defect in carbohydrate metabolism.

Strictly speaking, the true hepatic type does not come under the heading of diabetes, for, although the urine reduces Fehling and Benedict's solution, &c., and gives an osazone with phenylhydrazine similar to that of dextrose, this is not due to the presence of a sugar, but to an alphaketonic acid to which I have given the name "iso-glucuronic acid," although it is more convenient to refer to it as pseudo-lævulose, since, like lævulose, it is lævorotatory. Pseudo-lævulose is met with in the urine of most advanced cases of diabetes, along with dextrose, especially if the diet contains much protein, for it is from protein that it is probably derived, but it may also occur alone and lead to an incorrect diagnosis of diabetes. To treat such cases on orthodox lines may do more harm than good. The ordinary carbohydrate-free diet only makes matters worse, and, although starvation will clear the urine of reducing substances, the same result may be obtained, with much greater comfort to the patient, by eliminating, or strictly limiting, the protein in the diet and giving an abundance of vegetables, with dextrinised starches, in the form of oatmeal, potato, &c., or pure dextrose. Under this treatment the urine rapidly becomes normal, and after a few weeks the patient can gradually resume his ordinary food, provided that protein is taken sparingly. So far as I can see at present the prognosis seems to be good, for I have several patients who have remained sugar-free and in excellent health for three or four years. It seems probable that some of the success of the various carbohydrate "cures" for diabetes is to be explained by cases of this kind.

The Pancreo-Hepatic Type: "Gouty" Glycosuria.

In what I have termed the pancreo-hepatic type there may, or may not, be evidence of intestinal catarrh at the time they come under observation, but they always show signs of pancreatic insufficiency and more or less disturbance of the functions of the liver, most likely the result of an infection from the intestine by way of the ducts or lymphatics. The relative importance of the two conditions varies considerably, and they merge into the pancreatic type in the one direction and into the hepatic on the other. There is a corresponding difference in the probable course of the case and the form of treatment most likely to be of benefit. The prognosis is most hopeful when hepatic insufficiency is the more prominent feature, such cases corresponding to what has been termed "gouty glycosuria." Typical attacks of gout are very rarely seen, however, but they are specially liable to what are termed "gouty" complications in the shape of cardio-vascular or kidney disturbances, neuralgia, and neuritis, the last two being the most common and severe. In reality these complications are dependent on the hyperglycæmia, for they persist so long as there is an excess of sugar in the blood. It is important to remember in this connexion that the disappearance of sugar from the urine does not necessarily imply a normal blood-sugar content; in fact, it is the rule for the hyperglycæmia to continue after the urine is sugar-free, so that if reliance is placed on analysis of the urine alone anti-diabetic treatment may apparently fail to control the symptoms.

CHART 2.

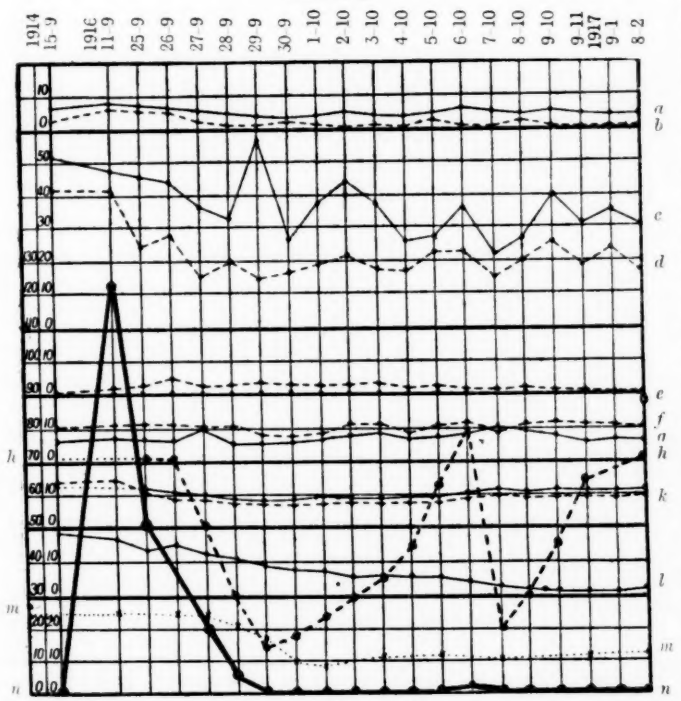


Pseudo-lævulose is generally present in these cases, sometimes constituting more than half the total sugar. Systematic examination of the urine usually shows, in addition, striking variations in the excretion of uric acid and creatinine, which moves in curves with several days' or weeks' interval between the crest and trough of the waves. Amino-acids are frequently present in considerable excess, and an abnormal output of urobilin is a common feature. The fæces may have the characters associated with catarrh of the upper intestine, but it is more common to find signs of chronic colitis.

In some a short period of starvation is helpful, but I have obtained the best results by merely limiting the carbohydrate and protein for several days, then giving one or two vegetable days, followed occasionally by a porridge or potato day. The subsequent diet is arranged according to the patient's tolerance for carbohydrate and protein, determined by regular blood and urine analyses. In many instances an alternating diet, arranged so as to control the pancreatic and hepatic insufficiency in turn, is the most satisfactory.

Typical "gouty" glycosuria is most common after middle life, but even in younger people a predominance of the signs of hepatic insufficiency warrants a more cheerful outlook than when they are absent. The tendency for the hyperglycæmia to persist after the disappearance of the glycosuria should be borne in mind if the treatment is to be really satisfactory, however.

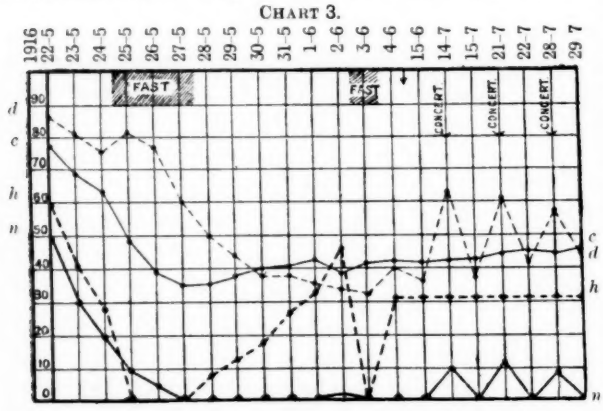
CHART 1.



a, True amm. N. × 10. *b*, Amino ac. N. × 10. *c*, Calcium × 100. *d*, Magnesium × 100. *e* (dotted), Acetone × 10. *e'* (continuous), Oxybuty. ac. × 10. *f*, Creatinine × 10. *g*, Uric acid × 10. *h*, Food carbohyd. *j*, Total ur. N. *k*, Food N. *l*, Indican × 100. *m*, Blood sugar × 100. *n*, Urinary sugar.

I have recently had under my care a case of this type in a young woman of 28 who had been twice treated by alimentary rest by different physicians with apparently satisfactory results at the time, but on each occasion sugar reappeared in her urine within a short period of her return home. I found that, as on previous trials, the urine became sugar-free after two days' starvation, but examination of her blood showed that it contained 0·2 per cent. of sugar, as compared with 0·29 per cent. before she was deprived of food and 0·3 per cent. when she first came under observation. It was not until she had starved for another two days that it dropped to 0·09 per cent. The patient went home with a new diet scheme and has remained sugar-free for a month, while her blood sugar has not risen higher than 0·13 per cent. (Chart 2.)

CHART 3.



Experiences of this sort bring home to one the necessity for controlling examination of the urine for sugar by analysis of the blood, and emphasise the fact that the aim of our treatment of diabetes should be to prevent hyperglycæmia, not merely to eliminate sugar from the urine. So long as blood-sugar estimations were difficult to carry out there was a valid excuse for our relying entirely on urinary analysis, but the modern micro-chemical methods[2] require so little material and are so readily performed that we should no longer be "content with the shadow, but grasp at the substance."

The Nervous Factor.

There can be no doubt that there is a nervous factor in many cases of diabetes, although it is rarely possible to prove it. I am inclined to think that the relation between the calcium and magnesium output in the urine may afford some indication, for I have found that the latter is usually higher than the former in nervous people, and on several occasions I have seen a sudden rise in the magnesium excretion, with little or no change in the calcium, as the result of nervous disturbances or injury.

Cases in which a nervous element is probably present answer well to alimentary rest, but always do best when treated away from home and their ordinary surroundings, owing probably to the mental effect of the change in environment. I urge these patients to take as much fresh green vegetable as possible because of the inorganic salts they contain, and I find that minute doses of magnesium sulphate three or four times a day tend to steady their nervous system and consequently control the glycosuria. Purgative doses should be carefully guarded against, however.

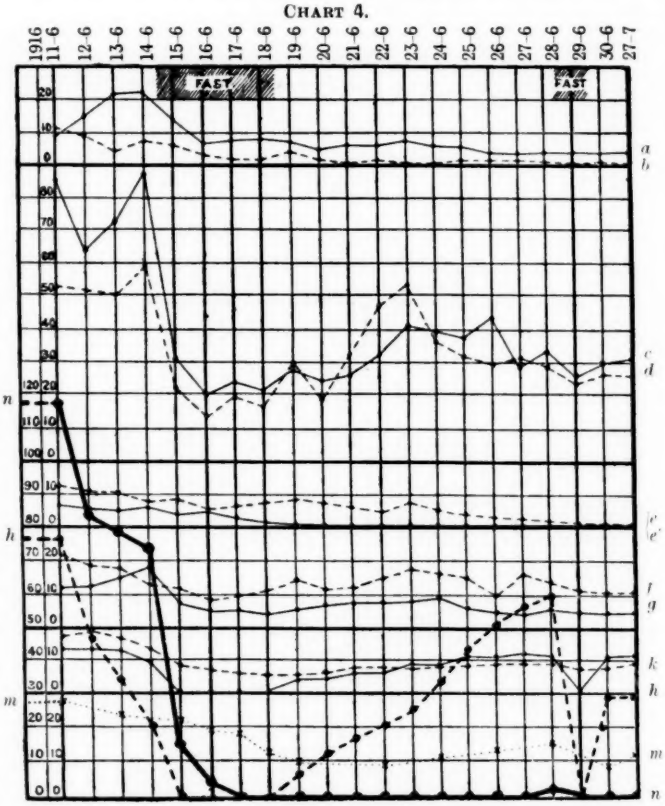
One of the most striking examples of the influence of nervous excitement on sugar excretion I have met with was in a musician who came under my care last year. Originally he excreted about 50 gm. a day, but became sugar-free after three days and four nights of starvation, the blood sugar coming down to normal next day. On the diet that was eventually worked out for him he remained sugar-free for over a month. Three days after he returned to work he passed 10 gm. of sugar, although no change had been made in the diet, and the next day's specimen was sugar-free. The same thing happened the following week, and I then found that on each occasion he had taken part in a concert and had been particularly affected by the music. So, as an experiment, I asked him to attend another of the same series of concerts, with the result that he again passed sugar in his urine. He has since confined his activities to less exciting work, and has had no return of the glycosuria. (Chart 3.)

Questions in Regard to Advising Fasting.

From what I have said it will be gathered that I do not look upon Allen's fasting treatment as the best for all forms of glycosuria, although I consider that it marks a great advance in the available methods and gives results which can be obtained by no other means in many instances. It should be used with judgment, however, and one should always bear in mind that the keynote of the treatment is under-nutrition. A practical question that sometimes arises, therefore, is whether a controlled, and may be a mild glycosuria, with an adequate diet and reasonable enjoyment of life, is not preferable to the theoretical ideal of a permanently sugar-free urine, which can only be obtained by a diet that will not satisfy the pangs of hunger and requires constant close supervision? The answer will depend on circumstances and the temperament of the patient. These should be considered carefully before advising the treatment, especially as, once it is begun, it must be continued; for as I pointed out in an article last year,[3] the return to an ordinary carbohydrate-free diet almost inevitably brings about a rapid increase in the acidosis, with excessive tissue waste and death from coma.

That such should be the case is not difficult to explain. Daily analysis of the urine during the fasting period shows that coincident with the fall in the sugar excretion there is a drop in the whole level of metabolism, the total nitrogen sinking until it stands at a steady level of 4 gm. or 5 gm. a day. At first there may be a rise in the output of uric acid and creatinine, but as the fasting proceeds they also sink, and the same is true of the amino-acids. A most striking change generally occurs in the acidosis. At first this, as shown by the total acidity, ammonia nitrogen, calcium, and

CHART 4.



[2] THE LANCET, April 21st, 1917, p. 613.

[3] Practitioner, 1916.

magnesium, may rapidly increase, and there is a corresponding rise in the excretion of acetone bodies. Sometimes the oxybutyric acid output is also increased temporarily, but often it falls from the first day, and is replaced by a larger excretion of acetone and aceto-acetic acid. Ultimately these also begin to clear, although some acetone may be excreted for a considerable time. Finally the ammonia, calcium, and magnesium, with the total acidity, reach normal levels, and the urine may afterwards become alkaline as vegetables are taken. After feeding is commenced, and particularly when protein foods are introduced into the diet, the total nitrogen rises again, but if the dieting is properly carried out the patient remains in nitrogenous equilibrium, and there is no increase in the acidosis. (Chart 4.)

Supposing now that a patient in this condition is suddenly transferred to a "carbohydrate-free" diet, the immediate effect of the largely augmented protein intake is to stimulate metabolism some 50 per cent. or more over what it would have been had the same caloric value been given in the form of carbohydrate, with the result that there is rapid tissue waste, with a greatly increased excretion of amino-acids, uric acid, creatin, and creatinine, a rise in the formation of acid bodies, and consequently increasing depletion of the alkaline reserves of the body, which are no longer being replenished by the bases contained in the vegetables that previously constituted so large a part of the diet. More fat and less carbohydrate are also being taken, so that the products of the imperfect combustion of fat are increased and added to the total acid bodies, still further depleting the alkaline reserves in the organism. Choked by the accumulated "clinker" of a diet it is incapable of metabolising, and worn out by the attempt to utilise its own tissues as a source of energy, the body soon becomes unable to carry on its work and the patient dies of diabetic coma.

Acidosis.

Formerly the most common cause of death in diabetes, coma should now be one of the rarest, for in starvation, followed by a largely vegetable diet, we have a powerful weapon for preventing and controlling the acidosis from which it arises. Essentially, acidosis results from the imperfect oxidation of fat, and this in its turn is dependent upon the faulty combustion of carbohydrate by the body, for fat seems to be a less readily oxidised foodstuff than sugar and needs the fire of burning sugar to bring about its complete combustion. It has been calculated that one part of dextrose to three parts of higher fatty acids is required for the purpose. If less than this proportion is available the fat "smokes," as it were, the smoke being represented in the body by abnormal acid products. Since the maximum rate at which dextrose can be oxidised by the diabetic is always lower than in health, the diabetic is not capable of completely utilising as much fat as a normal individual, so that acidosis is more prone to develop.

In order to check a diabetic acidosis it is necessary to restore the proper relation of fatty acid to dextrose oxidation, which may be done by diminishing the fat in the body and increasing the power to utilise carbohydrate. Fasting will obviously ensure the former, and it is well known that it also tends to increase carbohydrate tolerance, so that abstinence from food is the most rapid method of restoring the required balance. The immediate result of starvation will depend, however, on the amount of fat stored in the tissues, and therefore on the nature of the previous diet. If a diet rich in fat has been taken and there is a considerable deposit of adipose tissue, the sugar available may be quite inadequate to ensure anything like complete combustion, and there will consequently be a rapid rise in the acidosis until the fat has been used up and a more normal relationship has been reached, but even then the acidosis may continue to increase, for proteins contain fatty acid radicals, yielding acid bodies when they are imperfectly oxidised, and some diabetics have lost the power of utilising more than a small proportion of the dextrose contained in the protein molecule, which normally serves for their combustion. By persisting with the starvation the ability of the organism to utilise carbohydrate usually becomes so far restored that enough is available to control the formation of abnormal acid end-products from both sources.

Some Practical Conclusions.

From a consideration of these facts it is obvious that all cases of diabetes cannot be expected to react to starvation in the same way, the determining factors being the amount of stored fat, the power to utilise the carbohydrate deposited in the form of glycogen, and the extent to which sugar of protein origin can be made use of. Hence three practical conclusions may be drawn:—

1. There is more danger of serious acidosis developing during starvation in fat than in thin diabetics.

2. When acidosis is present the patient should be prepared for the starvation treatment by being put on a fat-poor diet for several days before abstinence from food is commenced.

3. An initial increase in the acidosis is to be expected, but should not stop the treatment unless it assumes threatening proportions, as it will most likely subside if the fasting is persisted with.

Occasionally nausea, marked prostration, increasing drowsiness, and deep breathing, in conjunction with the characteristic changes in the composition of the blood, alveolar air, and urine, indicate a severe and progressive acidosis. The fast should then be terminated for the time being and the treatment directed to the acidosis. A restricted diet, consisting chiefly of green vegetables, with alkaline therapy, for a few days will generally suffice to control the condition, and a further fast will then usually result in improved carbohydrate tolerance and a sugar-free urine without increasing the acidosis.

During the fasting periods weak patients should be kept in bed, but the more vigorous should be encouraged to take as much exercise as is practicable, since the duration of the fast is shortened thereby. After feeding is commenced regular exercise should be continued, and even weak patients should have massage or regulated exercises. Short periods of vigorous exercise are to be preferred to long monotonous walks, and are particularly advantageous immediately following a meal containing carbohydrate, but care should be taken to avoid excessive fatigue. Exercise is of especial benefit for children, as it promotes the building of active tissue at the expense of fat and favourably influences growth. Mental occupation is most desirable, and patients should be encouraged to continue their ordinary work as far as possible.

The Protein Intake.

Long before the appearance of Allen's work I had come to the conclusion that quantitative regulation of the diet is necessary in all cases of glycosuria and that control of the protein intake is quite as important as adjustment of the carbohydrate, for the exhaustive chemical analyses of the excreta carried out in most of my cases showed that merely eliminating sugar from the urine does not suffice to control the disease if the patient is not in nitrogenous equilibrium, and that the only way to maintain this condition is to teach him to take his diet quantitatively. A number of papers published between 1912 and 1915 embodied these conclusions, and it is therefore gratifying to find that they are important features of Allen's plan, although I regret to see that in the attempt to simplify the treatment a rule-of-thumb method for establishing a nitrogenous balance is generally advocated instead of the more laborious, but certain, determination by direct chemical analysis.

Systematic examination of the urine shows that when the protein in the diet of a diabetic is gradually increased beyond a certain point, varying with each case, evidences of a disturbance of nitrogenous metabolism appear before sugar can be demonstrated in the urine, and that if these are at once recognised and the protein cut down glycosuria can be prevented. Merely to rely upon the appearance of sugar in the urine is therefore far from being an ideal method of regulating the treatment. My experience with several patients who have come under my care after treatment with alimentary rest by others has confirmed my distrust of this "hit-or-miss" process of determining the protein tolerance.

As an example I may quote the case of a young man who consulted me in the beginning of January. He had been treated in the previous November by a physician who has copied Joslin's method of applying the fasting treatment, and stated that after a 24 hours' fast his urine had been found to be free from sugar. His final diet, on which he had remained sugar-free according to Fehling's test, contained 60 gm. of carbohydrate and 16 gm. of protein, with as much fat as he cared to take. He complained that although he had strictly adhered to the quantities allowed he was steadily losing strength, was exceedingly miserable, and suffered from frequent attacks of cramp.

Temporarily continuing the same diet I found that a 24 hours' specimen of his urine gave no reaction for sugar with Fehling, and showed only a slight turbidity with Benedict's test, while quantitative analysis gave just over 1 gm. of sugar for the day. Determination of the sugar-content of the blood showed 0·19 per cent. two hours after the morning meal, so there was evidently some hyperglycæmia. Further

investigation of the urine revealed other important changes. The total nitrogen exceeded the intake by more than 2 gm., there was a very high uric acid output, the creatinine excretion was nearly double the normal, the amino-acid nitrogen amounted to 200 mg. a day, the true ammonia was just over 1 gm., and there were 140 mg. of oxybutyric acid and 893 mg. of acetone bodies, besides an excess of calcium and magnesium.

After a few days on a fat-poor vegetable diet, and one day of starvation, the blood sugar fell to 0·06 per cent., the total nitrogen of the urine dropped to 5 gm., the oxybutyric acid disappeared, and the uric acid, creatinine, ammonia nitrogen, calcium, and magnesium excretions fell to normal, while only traces of amino-acids could be found. His diet was then gradually worked up again, guided by the results of daily complete analyses of the urine and blood-sugar estimations, when it was found that, although his carbohydrate tolerance still stood at about 60 gm., he could only be kept in nitrogenous equilibrium, and his blood sugar maintained at normal figures, if the nitrogen intake did not exceed about 10 gm. a day. With a diet containing these amounts, and a specified quantity of fat, he became more cheerful, ceased to lose weight, and no longer suffers from cramp.

I need not discuss in detail the adjustment of the carbohydrate content of the diet to the patient's tolerance, as, provided he is kept in nitrogenous equilibrium, it is a comparatively simple matter, although I should again like to emphasise the importance of controlling the urinary analysis by examination of the blood. In passing I may also remind you that the carbohydrate and protein in the diet of a child should not be increased at the same rate as in an adult, but proportional to the weight, 1 gm. of carbohydrate for a child of 15 kg., for instance, being about equal to 4 gm. for an adult.

The Fat Intake.

The regulation of the fat intake in diabetes requires much more care than is frequently given to it. Hitherto fat has generally been regarded as a "make-weight" by which the caloric value of the diet can be adjusted to the theoretical requirement worked out from the patient's weight, but modern research suggests that this idea, like that formerly held with regard to proteins, must be abandoned, and that careful control of the fat-supply is no less important than a correct adjustment of the protein and carbohydrate intake.

It is still a debatable point whether sugar can be derived from fat, but apart from this the recent experimental work of Allen on dogs has shown that restriction of the carbohydrate and protein in the diet alone only serves to suppress the symptoms temporarily, and that unless the total metabolic load on the weakened assimilative functions is lightened by keeping the fat also within strict limits, downward progress, similar to that often seen in the human subject, occurs. The observations of Bloor on the blood have likewise demonstrated that defective fat metabolism is much more common in diabetes than has been supposed, for he found that abnormal lipoid values occur very frequently, apart from obvious lipæmia. Bloor showed that these lipoids originate from the fat of the food, an increase leading to an accumulation of fat and its metabolites in the blood until a point is reached when they can be no longer held in solution by the plasma, while fasting and a reduced fat intake have the opposite effect and bring about more efficient metabolism. There appears to be no definite relation between the lipoid content of the blood and the excretion of acetone bodies in the urine, however. Regular determinations of the lipoids in the blood would no doubt afford the best guide to a correct adjustment of the fat content of the diet and prevent overloading of the faulty mechanism, but the process is too long and complicated for routine clinical work at present, and one has to fall back upon such rough tests as the appearance of the blood and changes in weight.

I have already indicated the importance of not commencing the fast in severe cases with acidosis until the patient has been prepared by a few days on a fat-poor diet, but it is equally important that fat should not be added to the diet subsequently until a considerable tolerance for carbohydrate and protein has been established. Eggs are therefore often not the best form of protein to start with, as is usually advised. A creamy blood, an increase in the ketonuria, or the appearance of sugar after more fat has been introduced into the diet should be controlled by reducing the fat intake; otherwise it is best so to regulate the diet that a progressive loss of weight is prevented, while a gain, or rather an increase in adipose tissue, is avoided.

Periodical Curtailment of Diet.

Even when the total caloric value of the diet and the body mass have been reduced to correspond to the defective assimilative capacity of the patient, there is a risk that his metabolic powers may still be over-taxed if they are constantly worked at the same level. It is therefore advisable that the diet should be materially curtailed at regular intervals. The extent of the reduction and the frequency with which it is required will depend upon the severity of the case and the response to the preliminary treatment, so that no hard-and-fast rule can be laid down, but generally an all-round reduction by one-half for one day each week is required. In some cases this means that the patient must fast, in others that he is limited to low-value green vegetables, maybe with two or three eggs, while in others again a fair amount of carbohydrate food can be taken, provided that the fat and protein intake are kept low. When carbohydrate tolerance is very defective it may be advisable to prescribe one or two vegetable days in addition.

As the patient improves his allowance of carbohydrate is gradually increased, and the stringency of his fast, or semi-fast, days reduced, but he must advance a step at a time, with sufficient interval between each to test thoroughly his powers of dealing with the larger ration. The protein allowance in any case should aim at the standard of Chittenden rather than that of Voit, and no addition should be made, under any circumstances, until the patient has been in nitrogenous equilibrium for several weeks and all traces of acetone bodies have disappeared from the urine; even then it should be increased very cautiously, guided by the relation between the nitrogen content of the diet and the output in the urine. In this connexion I may point out that many so-called diabetic foods and breads, if not fraudulent as regards their carbohydrate content, consist chiefly of protein, which must be allowed for when they are used. As ordinary bread is rarely well tolerated by diabetics, some substitute of this description is often most useful, but it should never be given unless its carbohydrate, protein, and fat content are known and its composition is reliable.

Acid-Base Equilibrium.

I should have liked to consider in detail a subject to which I have recently devoted considerable attention, namely, the influence of the inorganic salts of the diet, and particularly the alkaline bases, on metabolism in diabetes, but a brief reference must suffice at present. Incidentally I have referred to one aspect of the matter when speaking of nervous disturbances, and it is needless to remind you of the importance of alkalies in treating acidosis, but there are other problems involved than these. Experiment has shown that the mechanism regulating the level of the blood sugar is peculiarly sensitive to disturbances in the acid-base equilibrium of the body, acid production leading to hyperglycæmia, while alkalosis exerts an opposite influence. Since meats and cereals are in general acid-producing foods, while vegetables and fruits usually yield an excess of bases, a diet rich in protein will tend to raise the sugar content of the blood, whereas a vegetable diet will lower it. May this not be one of the reasons why the largely vegetable diet usually given after the fast in the alimentary rest treatment is associated with an increase in carbohydrate tolerance, and a partial explanation of the deleterious effect of more protein than is needed for making good the actual wear and tear of the body?

Applying these ideas concerning the influence of the acid-base equilibrium of the body on carbohydrate metabolism to treatment, Murlin and Kramer, and more recently Underhill, have reported considerable improvement in cases of glycosuria subjected to careful alkaline therapy. Underhill employed large doses of sodium bicarbonate, while Murlin and Kramer used normal sodium carbonate, given intraduodenally in 1 per cent. solution. That alkalies increase sugar tolerance is an old idea which has been under a cloud for some years, but old clinical beliefs often contain a germ of truth, and it seems that further research on these lines may reveal methods of controlling glycosuria other than mere limitation of the diet.

At present our only reliable means of combating the disease is management of the diet, but in order to obtain the best results and actually halt the diabetic process it is necessary that it should be carried out with knowledge and as nice discrimination as the selection and prescription of a drug. Time and care devoted to the chemical aspect of each case render the task easier, and would prevent the empirical employment of one routine method, so saving many patients from unnecessary hardships and inconveniences. It is not

enough to consider only the glycosuria, or even the end-products of metabolism in the urine, the information to be obtained from analysis of the blood and fæces should also be taken into account, and I venture to think that the time is coming, and will come shortly, when a physician who attempts to treat a case of diabetes guided only by examination of the urine for sugar will be held as guilty of negligence as the present-day surgeon would be who failed to employ radiography when treating an injury of the bones or joints.

Nottingham-place, W.

THE LOCAL TREATMENT OF MENINGOCOCCUS CARRIERS WITH ANTISEPTICS.

(A REPORT TO THE MEDICAL RESEARCH COMMITTEE.)

BY P. FILDES, M.B., B.C. CAMB.,
ASSISTANT BACTERIOLOGIST TO THE LONDON HOSPITAL; HONORARY STAFF SURGEON, R.N.V.R.;
AND
P. B. WALLIS, B.A. CAMB., M.R.C.S., L.R.C.P. LOND.,
SURGEON, R.N.

(*From the Laboratory, R.N. Hospital, Haslar.*)

OWING to the measures adopted in the Navy to limit the spread of cerebro-spinal fever a large number of carriers were detected in the Portsmouth depôt and isolated in a special camp. It then became necessary to attempt to sterilise the throats of these men, and, although from analogy with other diseases the local application of antiseptics appeared likely to be unprofitable, it was thought desirable to give these a trial. If the antiseptic did not destroy the cocci in the throat, it was possible that it might prevent the cross-infection from one man to another. Further, the use of inhaling rooms in the Army had been said to give encouraging results.

In an experimental treatment of this sort there were three important matters to be considered: (1) The antiseptic to be used; (2) the method of application; and (3) the index of cure.

1. *The Antiseptics Used.*

The antiseptics most thoroughly tested were chloramine-T and acriflavine. Dakin's new dichloramine compounds came to hand too late in the season to make a satisfactory test. Other antiseptics were boracic acid, carbolic acid, magnesium hypochlorite, formalin, potassium permanganate, guaiacol, and several others. In addition to these, we administered to a few men a placebo in the form of tablets of formalin.

2. *The Method of Application.*

Chloramine-T was applied in two different ways:—

(*a*) In an inhaling chamber, the drug being dispersed as a fine cloud by a high-pressure steam-jet. This apparatus differed in design from that proposed by Colonel M. H. Gordon for the Army, but no doubt gave similar results. A 5 per cent. solution of chloramine-T was used in the reservoir of the nebuliser; this strength was found to give as powerful an atmosphere of chlorine as was pleasant. The room accommodated about 10 men and these remained therein for about 15 minutes per diem. They were instructed to breathe strongly through the nose during this time, but there was no way to ensure that these orders were carried out, and in many cases they probably were not.

(*b*) In a nasopharyngeal spray. This was a glass hand-spray made by one of us, the nozzle of which was readily slipped through the mouth into the nasopharynx. Two or three pumps were given with the bellows and the chloramine-T (2 per cent.) thus came copiously into contact with the whole nasopharynx and often dripped from the anterior nares. This treatment was applied once a day.

Acriflavine (kindly supplied to us by the Medical Research Committee), in a strength of 1 in 500 in salt solution, was applied daily with our nasopharyngeal spray.

The other antiseptics mentioned were used in the earlier stages of the investigation. They were all applied with Parke, Davis, and Co.'s "Glaseptic" nasal spray until the drug could be felt in the nasopharynx. The strength of boracic acid was one drachm to the pint, of carbolic 1 in 200, of formalin 1 in 200, and of potassium permanganate 1 in 1000.

3. *The Index of Cure.*

The apparent value of these antiseptic treatments depends very largely upon what end it is proposed to achieve and the exact manner in which the process is carried out. In general the technique is to apply the treatment until swabs taken from the nasopharynx fail to reveal the meningococcus. The man is then looked upon as cured. There are, however, a number of fallacies which must be avoided.

(*a*) The treatment must not be carried on continuously during the whole period of quarantine for two reasons. First, the treatment if applied on the day that the swab is taken will directly vitiate the result. We have therefore always allowed 24 hours to elapse after treatment before the swab is taken. Secondly, the treatment if applied continually will readily diminish the number of meningococci or reduce their vitality so that they will not grow in culture, but when treatment is stopped they will frequently reappear again. It is therefore essential not to apply treatment continually, but to give the man a chance of relapsing before he is said to be cured. In practice the routine has been as follows:—1. Upon receipt a positive carrier is treated once a day until his next swab is due—that is to say, until six days have elapsed since the first swab. In practice this is usually one or two days' treatment. 2. Treatment is stopped 24 hours before the swab is taken. 3. It is continued after the swab is taken until the report is received. 4. If this is negative treatment is stopped, and if the man remains negative on weekly test, no further treatment is given. 5. If the report is positive, treatment is continued until the next swab is due. More recently, in order to give the "positives" a greater degree of treatment, we have swabbed them while positive every 14 days instead of every week. On a negative swab being obtained, however, we reverted to the weekly tests.

(*b*) A certain period of time must be allowed to elapse after a negative swab is obtained before a man is said to be cured, in order that the permanency of the cure may be established. It is customary for a certain number of negative swabs at fixed intervals of time to be required before a man in the services is allowed out of quarantine. The precise number of swabs has never, to our knowledge, been accurately worked out. In the Army it was two, while the Navy at one time required six weekly negative swabs. During the past season this number was reduced to four. All our carriers, therefore, have been retained under observation until at least four negative swabs have been obtained, and we are thus able to give more accurate information as to the permanence of cure in these cases.

The following figures show the number of relapses which occurred after various numbers of "negatives" had been obtained. 375 carriers (pure "Gordon" types) were subjected to the "4-negative" standard. Of these—

137 relapsed (185 times) after 2 "negatives" = 36 per cent.
63 ,, (74 times) ,, 3 ,, = 16 ,,

A small number of men were examined by mistake or for various reasons for more than the necessary 4 "negatives." Of these—

13 carriers relapsed after 4 negative swabs.
5 ,, ,, ,, 5 ,,
4 ,, ,, ,, 6 ,,
2 ,, ,, ,, 7 ,,

The number of carriers who were examined after four "negatives" is so small that no statistical capital can be made out of these latter figures. Nevertheless, it is certainly remarkable that so many relapses were observed in so few cases. From the foregoing figures it is clear that if two negative swabs are taken as the index of cure no less than 36 per cent. of the men will, in fact, not be cured, and will be returned to the community in the same condition as they were before they were isolated. It is also clear that under these conditions of "cure" a form of treatment may readily be supposed to have a value which is quite fictitious.

The number of negative swabs which constitutes a cure is a practical question which has to be decided with due regard both to inconvenience to the Service and to safeguarding the Service. It appears to us that it would be irrational to undertake a very extensive system of control, as in the Navy, and then to stultify that system by prematurely discharging one-third of the proved carriers on two negative tests. Clearly the proved carrier is the man on whom attention should be most concentrated if extensive administrative measures are taken against this disease at all, and thus it would appear that the naval routine of four "negatives" is better than two "negatives." The number of men involved

when the carriers are only derived from contacts is so small relatively to the whole Service that four "negatives" should not entail undue inconvenience. In all our cases, therefore, the index of cure has been four consecutive negative swabs taken at weekly intervals. During the whole of this time no treatment has been applied in order that every opportunity for early relapse might be present.

The Results of Treatment.

Owing to the relatively small number of carriers and to the fact that at first the treatment was often changed, the estimation of the value of these different methods is difficult. On examining the figures, however, it is soon found that there is another factor which enormously increases the difficulty—namely, that one-third of the men become cured immediately upon entry into the isolation camp *whatever the treatment applied to them may be.* Thus of 375 carriers of pure "Gordon" types, 124 registered their four consecutive negative tests immediately upon entry into the isolation camp. The treatment applied to these men was practically nil, since by the time the "doubtful" colonies had been proved to be positive, and the man had been removed to the isolation camp, the greater part of the week had passed and only one, or at the most two, days' treatment remained before it had to be stopped preparatory to the next swab. When it is remembered that this treatment consisted of formalin tablets and boracic nasal sprays, as well as chloramine-T and acriflavine nasopharyngeal sprays, it appears justifiable to us to regard the effect of treatment as nil, and to assume that these men cleared up spontaneously. Since, then, one-third of the men are cured spontaneously, a drug must be very decisive in results before its curative action becomes very obvious.

The effect of the antiseptics has been estimated in two ways: (1) by calculating the ratio of cures to the number of men treated by each antiseptic; and (2) by counting the number of men who obtained 4, 3, 2, 1, or no "negatives" *immediately* upon starting upon a particular treatment.

TABLE I.—*Showing the Cures Effected by Various Treatments.*
TABLE II.—*Showing the "Immediate Negatives" obtained by Various Treatments.**

TABLE I.

Treatment.	Number treated.	Number cured.	Per cent. cured.
Chloramine-T inhaling room	85	43	50
Chloramine-T spray	96	60	62
Acriflavine	101	59	58
Boracic	50	29	58
Carbolic	64	30	46
Magn. hypochlor.	50	28	47
Formalin	65	29	44
Pot. permang.	63	30	47
Guaiacol	35	17	50
Formamint	14	5	35
Average	632	330	52

TABLE II.

Treatment.	Number treated.	Immediate negatives.				
		4	3	2	1	0
Chloramine-T inhaling room	91	38	2	15	4	32
Chloramine-T spray	99	40	2	13	10	34
Acriflavine	101	51	11	9	26	4
Boracic	31	22	0	7	1	1
Carbolic	54	27	0	8	5	14
Magn. hypochlor.	52	25	0	5	8	14
Formalin	55	22	0	11	6	16
Pot. permang.	47	17	0	5	5	20
Guaiacol	26	8	0	4	0	14
Formamint	15	6	0	3	0	6
Average	—	—	—	—	—	—

* In Table II. the cure is credited to that treatment under which the man was last.

Table I. shows that about 50 per cent. of the men treated by any method were cured. Any variation in the percentage is not greater than might be produced by chance and has no significance.

Table II. shows that with each form of treatment 40–50 per cent. of the men are cured immediately; with boracic acid alone is the figure much higher, but here the factor of error due to small numbers comes in acutely. This percentage (40–50) corresponds roughly to that given by all treatments together (33) which, as has been explained, may be assumed to be no treatment. The difference between the 33 per cent. of no treatment and the 40–50 per cent. of treatment is due, not to the efficacy of treatment, but to the fact that the two figures are calculated from two different series of men. The 33 per cent. relates to carriers of meningococci which agglutinate with monovalent sera, while the 40–50 per cent. refers to a series which includes in addition a number of carriers of cocci which agglutinate feebly or not at all with monovalent sera. These latter often fail to agglutinate, and therefore these carriers are more easily "cured."

It is clear that the therapeutic effect of none of these antiseptics is sufficiently great to class one as better than another.

On examining the figures of those men who remained positive after treatment, it is again observed that the results are fairly similar; about one-third of the men failed to obtain a negative immediately after treatment. Acriflavine and boracic are exceptions to this rule; the former showed only 4 positive in 101 after treatment, and the latter 1 positive out of 31. In the case of acriflavine these positives have passed into the group of "1 immediate negative," and there is some evidence that acriflavine actually does produce a transient inhibition of the bacteria.

Conclusion.

Looking at the results as a whole, we conclude that one-third of the men recover spontaneously, and that none of the methods of treatment tested has any conspicuous merit, nor has one any obvious advantage over another. This result is what might be expected from analogy with work on diphtheria carriers.

We are much indebted to Dr. John Brownlee, statistician to the Medical Research Committee, for opinions upon figures submitted to him.

ON THE CLOSURE OF WAR WOUNDS IN HOME HOSPITALS.

BY JAMES PHILLIPS, F.R.C.S. EDIN.,
MAJOR, R.A.M.C. (T.C.); OFFICER IN CHARGE, SURGICAL DIVISION, BRADFORD WAR HOSPITAL.

As the result of experience gained during the last two and a half years it has been found possible to render wounds, the discharges from which have been teeming with pus organisms, surgically clean, so that in a period varying from a very few days to at most a week or two, an infected wound can be stitched up with every prospect of something approaching primary union taking place.

The two surgeons whose names are chiefly associated with these results are, in this country, Rutherford Morison and, in France, Carrel. Through the courtesy of Sir Berkeley Moynihan I was privileged in October, 1916, to see Mr. Rutherford Morison demonstrate his method of treating war wounds with "B.I.P.P.," and also to hear Dr. Sharman, of Pittsburg, who had spent some months in France seeing war surgery, relate his experiences at Carrel's hospital. More recently I heard Colonel C. J. Bond, of Leicester, describe the Carrel-Dakin treatment, and not less useful have been several discussions on the subject with Colonel Moynihan himself.

Between November, 1916, and the end of June, 1917, I have performed well over 300 operations for the closure of war wounds at the Bradford War Hospital and have gradually evolved a technique (which will probably be further modified as my experience grows, but) which already gives me results which I regard as very satisfactory and which I propose to describe in this article. This I shall do at some length, since I consider that the highest percentage of good results can only be obtained by following out the method in detail.

The Carrel, B.I.P.P., and Bradford Methods.

The Carrel method.—The Carrel treatment consists (1) in the sterilising of the wounds, and (2) in the suture of the surgically clean wound. When a case is seen soon after the wound has been inflicted an anæsthetic is given; the skin around the wound is thoroughly cleaned and the wound is freely opened up, foreign bodies, lacerated muscles, damaged skin edges, and loose bone fragments are removed, all bleeding is stopped, and special tubes are inserted, through which is instilled into the wound every two hours a solution containing 4·5 per cent. of active chlorine—the object being to keep an efficient antiseptic constantly in contact with the whole of the wound surface. The discharge is microscopically examined every day or two, and in from 5 to 11 days the wound is usually sterile enough (1 organism to each 4 microscope fields) to enable it to be completely stitched up and for primary union to result. Colonel Moynihan tells us that notices are hung up in Carrel's wards to the effect

that every wounded man whose wound suppurates has a right to demand an explanation from his surgeon!

Now the problem of wound closure in the British war hospital is not so simple as this. Cases come over from France in hundreds labelled "Carrel-Dakin treatment"—with one convoy over 40 such cases came to Bradford—but they are almost without exception suppurating, generally profusely; commonly the tubes have been removed, and if they are still in the instillation of Dakin's fluid has been intermitted. The process of wound cleansing has to be started all over again, and although, sometimes in a few days, more often only after a week or two have elapsed, the bacteriologist is able to report that the wound is surgically clean, my experience is that simple suture undertaken then is likely to be followed by something disappointingly short of primary union. Nor is this to be wondered at when we remember how real a fact latent sepsis is; how, many months after a wound has healed, forcible movements or even simple massage may light up infection—suppuration, or tetanus, or even gas gangrene—it is easy to understand that, during the suppuration period, organisms will have had time to "dig themselves in" to the deeper tissue cells, from which they are able to sally forth to upset the healing process in the stitched-up wound.

The B.I.P.P. method and its limitations.—Morison's B.I.P.P. method aims at introducing into a wound, admittedly infected, chemicals which for a long period continue to generate disinfectant agents, which experience has shown will effectually keep under the infection and allow healing to proceed. In many cases the results are excellent, but commonly some area of the wound has to heal by granulation. Occasionally pus collections form and require draining, and whenever there is much loss of tissue and consequent tension on the stitches these are likely to cut out and allow the skin edges to gape.

The Bradford method.—The method which experience has led me to adopt includes something of the B.I.P.P. method along with the Carrel-Dakin treatment, and may now be described in detail.

I. *Wound Sterilisation.*

Most of the wounds as they arrive from France have already been opened up. Where pus is pocketing in the track of a through-and-through wound, or beneath or between two adjacent muscles, or where loose bone fragments or other devitalised or foreign bodies are present, an anæsthetic must be given and the wound cleansed and laid freely open. *The skin incision whenever possible should extend the whole length of the wound.* A wound with a narrow bottle-neck opening may have a Carrel tube in it and Dakin's fluid instilled into its cavity, but it is nevertheless not being treated by Carrel's method.

The ideal Carrel wound is a basin which can easily be kept full to the brim with Dakin's fluid. Such a wound would be a deep flesh wound in the front of the thigh. Into the depths of such a wound are passed one or more tubes of about ¼ inch calibre, of which the distal end is closed by a ligature and which has a few tiny side holes punched in that part of the tube which lies in the wound. The tubes are connected with a reservoir containing Dakin's fluid hung over the bed, and every two hours the nurse releases a clip and allows just enough fluid to escape to fill the wound to the brim without allowing any to run over.

Posture can often be utilised to make it easier to apply the proper treatment—e.g., a man with a wound on the outer surface of his right thigh can be made to lie comfortably on his left side—so that his wound is uppermost. And it is remarkable how contentedly a man with a wound of the buttock will lie for days together on his face.

When the wound is so situated that it cannot be made to hold fluid basinwise, gauze 8 to 12 thicknesses is cut exactly the shape of the wound but about ⅛ inch less in diameter, so as to leave a tiny red margin all round when the gauze is tucked into the wound. The Carrel tube is placed deep to the gauze, which is saturated with fluid every two hours.

In some of the hospitals in France an elaborately constructed wool and tissue covering is pinned around the affected limb. Personally I favour extreme simplicity of dressings; a cage over the wounded part, and no dressing but simply a dressing towel placed so that it keeps dust and flies from the wound but not touching the wound itself, since if it is allowed to do so it will absorb fluid from the wound surface and so tend to defeat the object sought. A really careful nurse who understands the principles of the treatment can generally manage to regulate the supply of Dakin's solution, so that there is no overflow to irritate the skin; if fluid does run over and threaten to produce dermatitis, the simplest preventive is boric ointment melted in a glue-pot and painted with a brush on to the threatened skin.

The bacteriological examination.—Every third or fourth day a platinum loop-full of the discharge is taken from the wound surface wherever it looks least healthy and spread thinly and *uniformly* evenly on to a microscope slide. It is fixed by heat and stained (our bacteriologist, Dr. R. Honeyburne, finds brilliant-green a very satisfactory stain, differentiating well between nucleoli and organisms) and examined with a 1/12 inch oil immersion lens. The organisms on ten fields are counted, and I make it a rule not to attempt to close a wound until two reports of an average of less than three organisms per field have been returned.

II. *Wound Closure.*

Flesh wounds.—1. The skin around the surgically clean wound is cleansed in the ward by the nurses, much as the skin prior to a clean operation is, but only so far as it can be done without causing pain. In the theatre under general anæsthesia the skin is vigorously rubbed over with biniodide of mercury in spirit (1 : 500). 2. The edges of the wound are trimmed with a scalpel evenly all round—rather less than ¼ inch of healing edge being removed, but in wounds which are tending to scar over all the scar tissue is cut away. 3. The granulations are thoroughly curetted. 4. The skin edges are undercut; even in a small wound where the edges will easily come together they are undercut, as I find that much more accurate apposition is thus obtained. In large wounds, particularly with much loss of tissue, extensive undercutting is done. 5. Any definitely bleeding vessels are tied (oozing does not matter), the whole wound area is swabbed with methylated spirit and a little B.I.P.P.—never more than an eggspoonful and in a smallish wound half that quantity—is scrubbed into the raw surface with the gloved fingers. 6. Wherever possible any raw muscle surface is closed by bringing together the edges of the deep fascia (exposed by the under-cutting) with a running stitch of stout catgut. 7. Thick silk sutures (No. 5 pedicle silk boiled and soaked for 48 hours in tinct. iodi) are passed through the skin and the deep layers of the wound at intervals of about ¾ inch and tied tightly so that no "dead cavity" is left. Where there is tension on the part I find the most useful stitch a combination of a mattress with a simple surgical stitch. The mattress stitch is passed widely and deeply and pulled tight at one corner with a single loop; the needle is then passed through the skin edges, and on tying the final surgical knot wide apposition of the deep structures and accurate approximation of skin edges are obtained. 8. A continuous catgut stitch is used to complete the coaptation of the skin edges. 9. The skin is cleaned and smeared over with Moynihan's cream [1] and a simple dry gauze and wool dressing applied.

The dressing is not touched for 14 days. It is then removed; any discharge is wiped away and Moynihan's cream and another dry dressing are applied. At the second dressing a week later the stitches are removed, and never before.

Of 10 cases so treated I find that 7 or 8 will have healed practically by first intention, 1 or 2 will have gaped a bit at one part, leaving a superficial granulating area, and the tenth—practically always one where there has been loss of tissue and consequent tension on the stitches—will be a failure, at any rate in large part, and will require to be done again, or perhaps skin-grafting will be necessary.

It is not simply that healing is by this means accelerated and frequency of dressings enormously reduced; lineal non-adherent scars take the place of wide adherent disabling scars. I am sure that for years to come it will be our duty to reduce disability in war pensioners by excising the painful scars which limit movements and reduce earning capacity, and I have already performed a considerable number of such operations with the happiest results.

Compound fractures of long bones.—In cases of recent wounds with compound fractures I do not attempt Carrel's treatment but adopt Rutherford Morison's

[1] A mixture consisting of as much bismuth carbonate in 1 : 1000 watery solution of HgI_2 as will make a thick paste.

treatment, because by so doing the limb can at once be fixed in a dressing which does not require to be changed for a fortnight, and so a great amount of suffering is done away with. The following is a summary of Mr. Morison's own description[2]: 1. Under an anæsthetic clean the skin. 2. Open the wound freely, and, if possible, sufficiently to permit of inspection of its cavity. Cleanse the cavity with dry sterile mops, Volkmann's spoon, &c., and remove all foreign bodies. 3. Mop the surrounding skin and the wound cavity with methylated spirit. 4. Rub B.I.P.P. into all parts of the wound with dry gauze, removing any excess.[3] 5. The wound is then stitched with deeply placed iodised silk sutures, and a large dressing of iodoform gauze and sterile wool bandaged on. The dressing is not removed for a fortnight. If there is much discharge the outer dressing may be removed and a clean pad applied.

Frequently when the dressing is taken off the discharges, sometimes evil-smelling, are found plastered all over the skin, producing a most unpleasant appearance. But when the discharge has been bathed away the wound is usually found to be to a large extent healed, a narrow strip of superficial granulations remaining to be dressed once in every five or six days.

It approaches the miraculous to see a limb pouring foul pus from a wound at the bottom of which lies a segment of humerus or of femur smashed into a multitude of spiculed fragments, and every attempt at dressing which causes the patient untold agony, bandaged (if it is an arm) to the chest wall or (if it is a femur) fixed in a Thomas's splint, and after having been left untouched for a fortnight uncovered and found to show only a superficial granulating wound from which commonly the 14 days' discharge has been less in amount than that of one day previously. Not only is there saving of nursing labour and of pain to the patient and the conversion of a compound into a simple fracture, but the healing of soft parts takes place without that terrible formation of contracting scar-tissue which, by compressing the nerves, produces so frequently a helplessly paralysed limb.

Compound fractures of short bones.—In cases of smashed tarsus or carpus the missile has often "mushed" up one or more bones. An X ray plate may show no obvious bone injury, but unhealthy granulations will soon pout from a relatively small skin wound, the hand or foot becomes painful and tender, there is some fever and more or less swelling of surrounding soft tissues. Under an anæsthetic the wound (or, if there are two, the uppermost one) is opened up, the pulped-up bony tissue is scraped away thoroughly, and the wound made as basin-shaped as possible, the skin wound being enlarged until it is larger than any transverse diameter of the hole in the bones. One or more Carrel's tubes are inserted, and the wound cavity is kept constantly filled with Dakin's solution. The hole quickly becomes lined with healthy granulations; in a comparatively short time the wound has closed in and healed over. The majority of the patients get moveable joints. I have seen almost normal function after removal of the astragalus and part of the os calcis.

Chronic necrosis with sinuses.—There remains to be considered the case in which a fracture of a long bone has united, but a sequestrum is locked up in the callus or some less definite area of necrosed bone keeps up the discharge of pus from one or more sinuses. The first case I treated by the Carrel method may be described as a typical example.

A man was admitted to the Bradford War Hospital at the end of 1916 suffering from a badly smashed femur. The wound was bipped and the fracture united, and the man was sent to an auxiliary hospital, walking on crutches. A sinus appeared and continued to discharge pus even after a fairly large sequestrum had been removed. At Sir B.G.A. Moynihan's suggestion an extensive operation was performed. A 10-inch incision was made in the line of the femur, through the old scar on the front of the thigh. The incision was carried down to and through the periosteum and the soft tissues were stripped back from the bone. All the bony irregularities about the seat of fracture were freely chiselled away until the exposed section of femur formed a smooth, regular floor of a large basin-like cavity capable of holding several ounces of fluid. A sequestrum 3 in. long was found encapsuled in the new bone and removed. The skin was stitched back on either side, so that the wound remained funnel-shaped. It was treated on Carrel lines, being filled up with Dakin's fluid every two hours. In this case no tubes were used: the limb was adjusted with pillows until the wound margins were level and the fluid was poured in every two hours to keep the "basin" full.

In less than three weeks the bacteriologist was able twice to report the wound surgically clean. Under ether the soft tissues were freed from the bone, a little B.I.P.P. scrubbed into the raw surface and thick silk sutures used to bring together the whole thickness of skin and muscles over the bone. The first dressing was done 14 days later and almost primary union found to have taken place. A fortnight later a linear scar remained and the soft tissues were moveable over a smooth bone surface.

Such results as these make one feel that a new era has arrived with regard to the treatment of infected wounds and that surgeons will never again allow wounds to go on suppurating, satisfied with doing nothing to induce them to heal beyond draining and dressing them.

In conclusion I have to thank Lieutenant-Colonel W. Wrangham for permission to describe the work done at the Bradford War Hospital.

[2] British Journal of Surgery, April, 1917. THE LANCET, 1916, ii., 268.

[3] B.I.P.P. is made as follows: Iodoform, 16 oz.; bismuth subnitrate, 8 oz.; liquid paraffin, 8 oz., or a sufficient quantity to make a firm paste. The powders are mixed together in a mortar and the paraffin incorporated.

STUDIES IN WOUND INFECTIONS.

ON THE GROWTH OF ANAEROBIC BACILLI IN FLUID MEDIA UNDER APPARENTLY AEROBIC CONDITIONS.

BY S. R. DOUGLAS, M.R.C.S., L.R.C.P. LOND.,
CAPTAIN, I.M.S. (RETIRED); FIRST ASSISTANT, BACTERIOLOGICAL DEPARTMENT, MEDICAL RESEARCH COMMITTEE, NATIONAL INSURANCE ACT;

A. FLEMING, M.B., B.S. LOND., F.R.C.S. ENG.,
ASSISTANT, BACTERIOLOGICAL DEPARTMENT, MEDICAL RESEARCH COMMITTEE;

AND

L. COLEBROOK, M.B., B.S. LOND.,
CAPTAIN, R.A.M.C. (T.); ASSISTANT, BACTERIOLOGICAL DEPARTMENT, MEDICAL RESEARCH COMMITTEE.

(*From Inoculation Department, St. Mary's Hospital.*)

IT has been known for some years that the addition of a piece of animal or vegetable tissue to any fluid media had a beneficial action on the growth of the anaerobic bacteria.

Tarozzi was the first to point out the advantage of such a procedure, the *sine qua non* of his method being the addition to the fluid media of a piece of animal tissue, usually kidney or testicle, taken as soon after the death of the animal as possible. This method, in spite of the trouble involved in obtaining such tissues perfectly sterile, was used extensively by Noguchi in isolating various forms of spirochætes.

Later, Ori and Wrzosek showed that the substitution of a piece of potato or other vegetable tissue for the animal tissues used by Tarozzi was followed by equally satisfactory results, and further, that sterilisation by heat did not interfere with the beneficial effect of such a procedure.

Wright and Dreyer, working in Boulogne, employed as a routine method for growing anaerobes tubes of broth to which a piece of potato had been added previous to sterilisation, and by such methods obtained abundant cultures of all the prevalent anaerobes isolated from wounds without taking any further precautions for obtaining anaerobic conditions; it was even found that growth occurred when a stream of oxygen was passed through the fluid portion of the media.

The usual explanation of such results has been that the animal or vegetable tissues contained some body capable of acting as a reducing agent. That living tissues, both animal and vegetable, act as reducing agents is a well-recognised fact, but it is unlikely that a small pellet of potato after being autoclaved should be able to bind all the oxygen which would be constantly absorbed from the surface of the media.

It was therefore decided to confirm some of the experiments that had been carried out by different workers and to try to ascertain if any other explanation could be found for these somewhat surprising results.

Experiments with Vegetable Tissues.

In order to confirm the results obtained by Wright and Dreyer showing that all the usual anaerobes found in wounds give an abundant culture when a small piece of potato or other vegetable is added to the broth before sterilisation, a number of broth tubes were taken, to each of which a small cube cut from a potato was added, after which they were sterilised in the autoclave. Into these a variety of anaerobic bacilli were planted, and the tubes were then incubated at 37° C. without any further precautions to produce anaerobic conditions. The tubes were examined for growth after intervals of 24 and 36 hours. The results are given in Table I.

TABLE I.

No.	Laboratory name of culture.	Type of bacillus.	Result.
1	Grout I.	*B. perfringens.*	Copious growth after 24 hours.
2	Hancock I.	,, ,,	,, ,,
3	Boone II.	B. of malignant œdema.	,, ,,
4	McArdle E.	,, ,,	,, ,,
5	Tholby III.	,, ,,	,, ,,
6	McFadzean II.	,, ,,	,, ,,
7	McFadzean VII.	,, ,,	,, ,,
8	Boone I.	A non-motile bacillus resembling *B. perfringens* except in its fermentation reaction.	,, ,,
9	Tholby IV.	Gram-negative bacillus with round terminal spore.	,, ,,
10	Tholby.	Bacillus resembling *B. tetani.*	,, ,,
11	Boone III.	Hibler IX. type.	Copious growth after 36 hours.

This table shows that the addition of a small piece of potato to the broth before sterilisation enables cultures of the anaerobic bacilli commonly found in wounds to proliferate rapidly in the absence of any further procedures to produce anaerobic conditions.

Further experiments showed that pieces of carrot, cabbage, or grape were equally efficacious as potato. In addition to these substances flakes of bran were also employed, and an experiment was made in which different amounts of bran were added to the broth to ascertain if the growth varied with the amount of bran added. This experiment was carried out in the following manner: To a series of broth tubes, each containing 10 c.c. of broth, varying quantities of bran were added. After sterilisation in the autoclave each tube was planted with a loopful of broth culture of the bacillus of malignant œdema and then incubated at 37° C. without further precautions as regards anaerobic conditions. Examinations for the presence of growth were made at varying intervals. The results are shown in Table II.

TABLE II.

Amount of bran added.	Result after 18 hours.	Result after 36 hours.
1 flake.	No growth.	No growth.
4 flakes.	Slight growth.	Abundant growth.
10 flakes.	Good growth.	,, ,,
Many flakes.	Abundant growth.	,, ,,

This experiment shows that, up to a point, the more bran that was added the more copious and rapid was the growth. It may here be noted that of all the various substances which were employed in the experiments detailed in this paper to promote the growth of anaerobic bacilli in broth cultures, bran appeared to be the most efficacious.

Taking the result of these experiments into consideration, it was thought that some "foodstuff," such as vitamines, might have been given up to the broth by the vegetable substances added to it, which enabled the anaerobic bacilli to proliferate even when oxygen was present; in order to verify this, experiments were made to ascertain if anaerobic bacilli would grow in broth to which an alcoholic extract of bran had been added.

These experiments were carried out in several different ways. For instance, the alcoholic extract of bran was evaporated to dryness, and small portions of the substance thus obtained were added to the broth, or strips of sterile filter paper having been soaked in the alcoholic extract and then dried were placed in broth. Again, small quantities of the fluid alcoholic extract were added directly to the broth. These various samples of broth were then planted with anaerobic bacilli and incubated under ordinary aerobic conditions.

The results obtained by these experiments were conflicting. In some cases the broths containing the alcoholic extract gave abundant growths of the anaerobic bacilli, whereas control broth tubes gave no growth. In other cases, for instance, that experiment in which filter paper impregnated with the alcoholic extract had been added to the broth, growth appeared equally abundant in a control tube to which a piece of untreated filter paper had been added, as in those which contained the treated filter paper. It was also observed that growth occurred only in those tubes where a considerable mass of the solid alcoholic extract had been added or an extensive precipitate had been formed.

Experiments with Inert Substances.

Abandoning the idea that the growth of the anaerobic bacilli was due to the presence of any special "foodstuff," it was decided to carry out experiments to ascertain if growth would occur when various inert substances were substituted for the vegetable tissues.

In these experiments various porous substances, such as asbestos wool, cotton wool, lint, sponge, charcoal, chalk, cork, sand, cardboard, blotting-paper, khaki cloth, and, lastly, a rusty nail, were each added to a series of broth tubes, which were then autoclaved. Each series of tubes, together with a control tube of simple broth, were then planted with an equal quantity of an anaerobic bacillus and incubated under ordinary aerobic conditions. Examinations for the presence of growth were made after incubation had continued for 15, 18, 24, 36, and 48 hours. The results are given in Table III.

TABLE III.

Figures indicate the number of hours the tubes were incubated before growth appeared.

0 indicates no growth throughout the duration of the experiment.

– indicates that this special portion of the experiment was not carried out.

Bacillus planted.	Control tube of broth.	Substances added to broth.											
		Asbestos wool.	Cotton wool.	Lint.	Sponge.	Piece of charcoal.	Piece of chalk.	Piece of cork.	Sand.	Piece of card.	Piece of blotting paper.	Piece of khaki cloth.	Rusty nail.
B. perfringens	0	15	15	36	15	24	18	24	24	48	0	24	—
B. malignant œdema.	0	36	36	0	0	24	24	0	0	0	0	0	36
B. butyricus.	0	15	15	24	0	18	15	18	18	24	0	0	18
Pseudo-tetanus.	0	36	36	36	0	36	24	0	48	0	0	0	—
Tholby IV.	0	36	36	36	36	36	24	36	36	24	0	24	—

These results show conclusively that any porous inert substance when added to broth renders this medium quite as suitable for the growth of anaerobic bacilli, without any further precautions as regards anaerobic conditions being taken, as the addition of pieces of potato or other vegetable matter. These facts can be most simply explained by assuming that the bacilli lodged in the meshes of the various substances are locally able to produce anaerobic conditions, in consequence of which they proliferate at first only in the interstices of the material, but later also in the surrounding media.

On studying this table more closely it is, however, to be noticed that none of the tubes containing pieces of blotting paper developed any growth; in these tubes the paper added consisted of a small unfolded slip of thin blotting paper. Again, it is noticeable that growth developed only in two out of the five tubes containing pieces of khaki cloth. Owing to the small amount of this material available only a very small piece could be added to each broth tube, and during the process of sterilisation the woollen strands became so unravelled that none of these tubes contained a close-meshed mass comparable to that seen in the tubes containing the asbestos wool.

From these observations it appeared probable that neither in the case of the pieces of unfolded blotting paper or of the minute pieces of unravelled khaki cloth were suitable interstices formed to enable the anaerobic bacilli to produce the conditions necessary for their growth. It was therefore decided to carry out a further series of experiments in which different amounts of asbestos wool were added to the broth

in order to ascertain if a closely packed mass of this material afforded more suitable conditions for the growth of the anaerobic bacilli than a smaller and more open-meshed piece of the same material. This experiment was carried out as follows:—

Two strains of anaerobic bacilli were taken, one of which had been demonstrated to be a very strict anaerobe, the other being capable of proliferating under less strict conditions of anaerobiosis. Each of these bacilli were then planted into two culture tubes, the one containing ordinary broth, the other broth to which a quantity of sterile asbestos wool had been added. The quantity of asbestos wool added to these tubes was varied. In the tube in which the strict anaerobe was planted a larger and more closely packed mass of this wool was placed than in the tube in which the bacillus capable of growing under less strict anaerobiosis was planted. These tubes were incubated without further anaerobic precautions and examined after 24 hours, when it was found that the strict anaerobe showed abundant growth with much gas formation, while the less strict anaerobe, having only the protection of a small and open-meshed piece of asbestos wool, gave only slight growth and very little gas formation.

This experiment shows that the amount and consistency of the inert substance added to the broth is an important factor in making the conditions suitable for the growth of anaerobic bacilli.

Experiments with Capillary Glass Tubes.

In order to test further the soundness of the theory put forward above—namely, that growth takes place at first in the interstices of the mass of inert material, an experiment was made in which a hair-fine capillary glass tube was placed in the broth. Such a hair-fine glass tube would represent in its simplest form a single interstice in a mass of asbestos wool, and if the theory put forward above was correct the growth should commence in this tube and only later spread to the surrounding media. A further advantage of such an experiment was that even in the finest capillary tube growth could be recognised by the formation of minute bubbles of gas. These experiments were carried out as follows:—

A series of broth tubes were taken and planted with anaerobic bacilli, each variety of bacillus being planted in equal quantity into two tubes. Into one of the tubes, in the case of each bacillus, a hair-fine glass capillary open at both ends was placed, the other tube being kept as a control. The tubes were then incubated and after varying intervals examined for growth. In the case of the control tubes no growth was ever noticed but in a certain proportion of those containing the hair-fine capillary tubes growth appeared after an interval varying from 24 to 48 hours. That this growth commenced inside the capillary tube was shown by the appearance of minute bubbles of gas inside the tube before any evidence of growth could be detected in the surrounding media.

That it was only a proportion of those cultures containing capillary tubes which gave growth can be explained by assuming that, as these tubes would only contain a fraction of a cubic millimetre, and that, as the anaerobic bacilli were not planted out very thickly, a proportion of the capillary tubes would not contain even a single living bacillus.

In Table IV. a series of successful experiments are given, which show that all the anaerobic bacilli commonly found in infected wounds are capable of growing in broth to which such a hair-fine capillary tube has been added without any further precautions being taken to produce anaerobic conditions.

TABLE IV.

Laboratory name of bacillus.	Type of bacillus.	Broth control.	Broth + capillary tube.
Grout I.	*B. perfringens.*	0	Good growth in 36 hours.
Forrest I.	Malignant œdema.	0	,, 48 ,,
Forrest II.	*B. butyricus.*	0	,, 24 ,,
Tholby II.	Pseudo-tetanus.	0	,, 48 ,,
Tholby IV.	Gram-positive, acid-forming bacillus.	0	,, 36 ,,
Cullingford.	Putrefactive bacillus.	0	,, 24 ,,

Other Experiments: Summary of Results.

These results show that the growth of the anaerobic bacilli takes place at first inside the confined spaces; however, in order to show that anaerobic conditions were produced in the spaces, the following experiments were made.

Tubes of glucose broth were tinted with an aqueous solution of methylene blue, and a suitable mass of asbestos wool was then added. After sterilisation these tubes were planted with *B. perfringens* and incubated under the usual aerobic conditions. Rapid growth occurred, which was quite apparent after four hours, and it was noticed that the broth was completely decolourised in the immediate neighbourhood of the asbestos wool. On shaking the tube, however, the colour returned to its original density. This reduction and reproduction of the colour could be produced at intervals for several hours.

This experiment was repeated with broth coloured with sulphindigotate of soda with exactly similar results, and it was also found that some of the bacilli which were not very strict anaerobes were able to grow in this broth without any asbestos wool being added to it (especially when they were thickly planted), and that here also the decolourisation of the sulphindigotate took place at the bottom of the tube, where a large amount of bacilli were collected. It therefore seems certain that the anaerobic bacilli are either able to absorb oxygen rapidly or during their growth produce some very strong reducing substance which rapidly removes any oxygen that may be present.

Further experiments in which a similar technique was employed showed that during their growth the anaerobic bacilli were able to remove any oxygen from the culture media much more rapidly than many of the aerobic bacilli.

The above experiments show that the anaerobic bacilli are capable of proliferating freely in broth to which a piece of any inert porous substance has been added. The most convenient substance is a small pledget of asbestos wool, owing to the ease with which it can be sterilised by holding it in the flame of a Bunsen burner until it is red-hot.

These experiments also show that the growth takes place first in the interstices of the porous material; that in all probability anaerobic conditions are produced in these minute spaces; and that later the oxygen present in the surrounding broth is removed during the growth of the bacilli entangled in the porous mass.

Experiments with Substances under Anaerobic Conditions.

Lastly experiments were made to ascertain if a more rapid and more certain growth of the anaerobic bacilli could be obtained if in addition to the ordinary methods for obtaining anaerobic conditions a piece of inert porous substance was added to the broth into which the bacilli were planted. The details of these experiments are as follows:—

Experiment 1.—Six small test-tubes were taken and into each an equal quantity of sterile serum was placed, and each tube was then planted with an equal quantity of *B. perfringens* emulsion. Into three of these tubes a small compact pledget of asbestos wool was introduced, the other three tubes being kept as controls. After this all the six tubes were sealed with a layer of melted vaseline and incubated at 37° C. After three days' incubation it was found that no growth could be demonstrated in any of the three control tubes, whereas all the tubes containing the asbestos wool showed abundant growth. The absence of growth in the control tubes was probably due to the now widely recognised fact that *B. perfringens* will only proliferate in serum when the implantation is a heavy one.

Experiment 2.—A broth culture of the bacillus of malignant œdema was diluted by ten-fold steps to 1 in 1,000,000 dilution. Twenty c.mm. of each of these dilutions were then planted into tubes of: (i.) simple broth; (ii.) broth to which a small piece of potato had been added; (iii.) broth into which a pledget of asbestos wool had been placed. These tubes were then placed in the anaerobic apparatus described by McIntosh and Fildes and incubated at 37° C. The results obtained at the end of 24 and 48 hours are given in Table V.

TABLE V.

Media employed.	Result after 24 hours.	Result after 48 hours.
(i.) Broth.	No growth in any tube.	Growth in tubes planted with all dilutions up to 1 in 100,000.
(ii.) Broth + potato.	Growth in tube planted with culture diluted 1 in 10.	,, ,,
(iii.) Broth + asbestos wool.	Growth in tubes planted with culture diluted 1 in 10 and 1 in 100.	Growth in tubes planted with all dilutions up to 1 in 1,000,000.

These experiments demonstrate that anaerobic bacilli will grow both more rapidly and also from a smaller implantation when, *in addition to the usual anaerobic conditions*, some porous substance such as potato or asbestos wool is added to the culture medium.

AN UNUSUAL COMPLICATION OF LAPAROTOMY FOR GUNSHOT WOUND.

BY WILLIAM H. JOHNSTON, B.A., M.D., CH.B.,
CAPTAIN, ROYAL ARMY MEDICAL CORPS.

IN the following case of gunshot wound of the abdomen, with perforations of intestine, which were sutured, diffuse purulent peritonitis occurred as a complication, consequent upon rupture of an abscess in the anterior abdominal wall. Treatment by the Carrel-Dakin method was carried out, and resulted in recovery.

The patient, a soldier of a rifle regiment, aged 26, was hit in the abdomen by a rifle-bullet on April 4th, 1917. He was admitted by a field ambulance on the same day, where, after the administration of morphia, he was marked for urgent attention, and transferred immediately to a casualty clearing station. There also on the same day his abdomen was opened by a paramedian incision. Five holes in the small gut and two tears in the mesentery were sutured. No other injury was found, nor any foreign body. He had a mild peritonitis for 24 hours, but progressed satisfactorily.

Thirteen days later, on April 17th, the patient was transferred to a base hospital. On admission his condition was good, temperature being 97·6° F. and pulse 72. There was localised tenderness over the middle of the scar; otherwise the condition of the abdomen was excellent. He complained of a little pain referred to the area of the operation incision. There was no rigidity and the abdomen moved freely on respiration.

Suddenly, on the night of April 17th, about 10 P.M., he was seized with acute abdominal pain. He vomited frequently. His pulse rose to 120; his temperature at 6 A.M. on April 18th was 100°. On examination there was general tense rigidity, considerable tympanites, great tenderness, but no appreciable dullness in the flanks. At 8 A.M. he exhibited all the signs of a diffuse peritonitis; the vomiting continued, and his condition became critical.

Operation, 9 A.M., April 18th. The original incision was opened. An abscess cavity full of thick greenish yellow pus was found on the posterior sheath of the rectus, and extending between the divided muscle. This had tracked backwards and burst into the peritoneal cavity through the original line of incision. The abdomen contained some pints of a thin greenish, purulent, non-odorous fluid. There were flakes of lymph widely diffused upon the intensely congested bowel. From this fluid pure cultures of *Staphylococcus pyogenes*, a short-chained streptococcus, and *B. coli* were isolated.

The patient's condition was so grave that it precluded any extensive manipulation of the bowel. No perforations were found, nor was there any sign of the escape of intestinal or other visceral contents. After copious irrigation with Dakin's fluid four drains of ¼-inch tubing 2 inches long were inserted, one in each flank, into the right and left paracolic gutters, and one into each groin. (Figs. 1 and 2.) These were stitched in position, and through each a Carrel tube was introduced into the abdominal cavity, so that about 6 to 8 inches of the perforated tube lay inside the abdomen. The flank tubes were planted into the paracolic gutters. The groin tubes were allowed to lie free amongst the coils of bowel. In turn each Carrel tube was sutured to the wall of the outer large drainage-tube. The excess of Dakin's fluid was not mopped out from the pelvis. The original anterior incision was then closed by through-and-through silkworm-gut sutures, taking all structures at once. A small tube was introduced into the abscess cavity in the rectus sheath. At the time of the operation the incision wound was not "Carrelled." The anæsthetic administered was warm open ether, and subcutaneous transfusion with saline (about 1½ pints) was carried out during the operation. On completion of the operation, which lasted about 25 minutes, the pulse was 150, and the temperature subnormal. The patient's condition was then very grave.

In the ward the patient was put in the Fowler position. Subsequently, irrigation, with ampoule and tubing connected up to each of the four small Carrel tubes, was carried out three-hourly for the first two days and four-hourly for the next four days. Thereafter the irrigation was gradually slackened off from six-hourly to eight-hourly flushings. The total quantity of Dakin's fluid used at each flushing was from about 50 to 80 c.c.

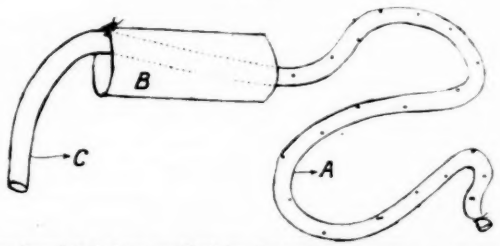
Pulse and Temperature during First Six Days.

—	Operation April 18th.		19th.		20th.		21st.		22nd.		23rd.	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
Pulse	150	120	96	112	72	88	72	88	72	72	64	80
Temp. (° F.) ...	98·5	97	97·3	98	97·5	98·5	97	99*	98·4	98·7	97·7	99·2

* First rise above normal after operation.

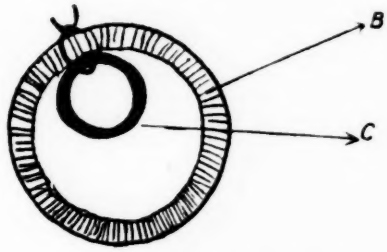
On the evening of the day of the operation the patient's temperature was subnormal and remained so until the evening of April 21st (three days). The change in pulse was remarkable (see table). It registered 96 on the morning after the operation and 112 in the evening. The temperature chart was equally striking. His first rise above normal after the operation occurred on the evening of April 21st, when his temperature reached 99°. The pulse rapidly fell to normal, regained its tone, and from the day after the operation ran steadily at about 72 to 88. From April 23rd he ran a slight evening rise of temperature (usually 99·2°) which continued for 24 days. During this time, in the mornings, the temperature was always normal. On May 16th his temperature remained steadily at normal and his pulse was then regularly about 76. Only on one occasion did the temperature rise above 100°—namely, on the evening of April 30th—when the pulse also rose to 104. The cause was obviously a localised collection of pus, which was not draining adequately through the laparotomy wound.

FIG. 1.



The Carrel technique modified for the peritoneal cavity. A, One end of the Carrel tube of which 6-8 in. are left inside the abdomen. B, Outer drainage tubing ¼ in. in diameter. C, Outer end of Carrel tube connected to irrigator.

FIG. 2.



Explanatory section on a larger scale.

Dressings.—Patient was dressed twice daily for two weeks, and thereafter once daily. Owing to local infection from the abscess all the stitches had gradually to be removed from the laparotomy wound by the end of the third day. Pocketing occurred on both sides in the rectus sheath. Pockets were opened by sinus forceps and Carrel tubes were introduced into their furthest extremities. The abdominal parietes were strapped effectively with strips of 2-inch adhesive plaster applied in a laminated manner from behind the back, circling around the abdomen and crossing the laparotomy wound transversely, spaces being cut in the

adhesive to allow for drainings and the re-insertion of the Carrel tubes. These strips had to be reapplied once daily.

At each dressing the Carrel tubes leading inside the abdomen were gently twisted round and slightly withdrawn through the outer large drains. They were then fixed by safety-pins as before, and the Dakin fluid was then turned on through the connexions for a few seconds. It was observed that on doing this in the first half-dozen dressings a copious amount of pus was washed out through the large drains. By gently moving the Carrel tube the coagulum at the inner end of the large drain was dislodged, and any free exudate was then washed out by the fluid from the Carrel tube. Gradually each day the Carrel tubes were drawn out, until at the end of 18 days (May 6th) all four were removed and the four small drainage-wounds allowed to close.

Calomel, gr. 1/6, was administered six-hourly for two days. Thereafter the patient obtained a natural action of the bowels and only once had an attack of colic, due probably to an indiscretion of diet. On April 20th, two days after the operation, patient's blood was examined and the count showed as follows: Polymorphonuclears, 52·5; eosinophiles, 5·5; granular basophiles, 3·0; large hyalines, 12·0; and lymphocytes, 27·0 per cent. Leucocytes, 20,000.

Thirty-three days after the operation, having made an excellent recovery, patient proceeded to England.

Remarks.—To sum up, the case appears to us to present certain points of interest: 1. Patient had already, prior to the operation for generalised peritonitis, undergone a laparotomy for a gunshot wound, with suture of several holes in the gut and mesentery. 2. At the time of the second operation his condition was undoubtedly grave. 3. The bacteriological findings at the time of the second operation pointed to a virulent infection. 4. His leucocyte reaction determined on the second day after his second operation pointed to a strong resistance.

There is no doubt that the bursting of the abscess in the rectus sheath was the cause of the diffuse peritonitis. There may be room for doubt that the abscess was a suture abscess. There is, however, little doubt that the infection *first developed* in the abdominal wall, originating either from within from contamination of the perforated gut, or from without from skin infection.

The ultimate excellent recovery, without for the moment considering Carrel-Dakin treatment, pointed to the fact that the first operation had been successful so far as repairing lesions in the gut was concerned. One is quite aware that even the worst cases of peritonitis sometimes go straight ahead after operation, but the clinical picture and the whole facts of the case point strongly to something more than coincidence here, and suggest the further investigation of the Carrel technique applied to the peritoneal cavity.

INOCULATION AGGLUTININS.

BY I. WALKER HALL, M.D. VICT.,

HONORARY CONSULTING PATHOLOGIST TO THE SECOND SOUTHERN GENERAL HOSPITAL; PROFESSOR OF PATHOLOGY, BRISTOL UNIVERSITY.

With the Assistance of

I. HILES, M.SC., AND F. NICHOLLS.

(*Report to the Medical Research Committee.*)

IN an earlier communication we recorded the agglutination titres observed in some individuals who had been inoculated previously with antityphoid vaccine. We also gave an account of the interaction of inoculation and infective agglutinins during the acute phases of paratyphoid fevers, and stated the results of concomitant absorption experiments which supported the views of Grattan, Wood, Harvey, Dreyer, and others, that the presence of infective paratyphoid agglutinins is associated with a tissue stimulation which brings about a rise in the agglutinins induced by the prior injection of killed typhoid bacilli.[1]

The advent of a number of convalescents who had been inoculated with the triple typhoid, para. A and para. B vaccine, afforded an opportunity for determinations of the extent and persistence of the inoculation agglutinins thereby occasioned and permitted an inquiry into their interaction.

The results now appended seem to suggest that the inoculation agglutinins which appear in the blood after the injection of dead typhoid, para. A and para. B bacilli tend to raise the titre for typhoid bacilli above that which follows when typhoid bacilli alone are employed, and that these titres are specific absorption titres and not due to co-agglutination.

Methods.—The methods throughout were precisely the same standardised procedures as those stated in our communication to the *Journal of the Royal Army Medical Corps* in September, 1916.

Inoculation Agglutinins for B. Typhosus *only.*

In 272 additional cases the single typhoid vaccine had been given and the results allowed comparison with similar findings in a further 77 cases inoculated before 1916, and another set of 268 cases examined in 1915-16 (Tables I. and III.). The figures in each lot are somewhat similar, although those for 1916 exhibit a larger number of negatives and a higher percentage of units over 650.

TABLE I.—*Typhoid Inoculation Agglutination Units per c.c. of Serum in Cases not Clinically Enteric.*

Inoculated 1916-17.

Weeks since inoculation.	No. of cases.	Units. Under 3	3-15	15-35	35-65	65-150	150-350	350-650	650-1250
		%	%	%	%	%	%	%	%
1-10	13	—	—	5	16·6	48·3	20	5	5
11-20	60	3·7	7·3	11·15	21·06	22·15	10·2	6·25	12·8
21-30	69	5·7	5·55	20·06	18·85	26·4	11·85	5·8	5·8
31-40	62	9·4	19·6	27	15·45	13·6	7·55	3·4	4
41-50	32	18·3	19·05	19·05	13·48	11·1	16·25	—	2·77
51-60	32	31·2	23·2	—	16·75	14·35	5·25	2·65	6·6
61-70	4	25	25	25	—	—	—	25	—
Totals ...	272	10·7	12·5	16·9	16·9	19·5	11	4·8	7·7
Inoculated before 1916.									
31-40	6	—	66·6	—	16·6	16·6	—	—	—
41-50	9	—	—	11·1	22·2	11·1	33·3	11·1	11·1
51-60	24	4·2	12·5	16·6	29·1	25	4·2	4·2	4·2
61-70	38	5·3	—	18·4	18·4	36·8	15·8	—	5·3
Totals ...	77	3·9	9·1	15·6	22·1	28·5	13	2·6	5·2

Inoculation Agglutinins for B. Typhosus *and* B. Paratyphosus A *and* B.

In Table II. the titres obtained from the blood of 310 convalescents are incorporated. These men had all been injected with the triple vaccine. It will be seen that the units for *B. typhosus* show a larger number of higher positives than those found when the single vaccine was injected (Tables I. and III.). The para. A and B units differ considerably, those of para. A being uniformly lower than the para. B, but in both instances the extent and persistence of the agglutinative capacity are greater than what we had been led to expect from previous animal and human experiments.[4 1]

The question, therefore, arises as to the respective parts played by the interacting stimuli emitted by the three types of bacterial protein. It is generally accepted that during infection, and also after inoculation with para. A bacilli, the agglutinin response is meagre and does not persist for a long period, while both typhoid and para. B infections and injections evoke a response in agglutinative capacity which is high and continued. The figures we now present, however, denote a considerable amount of agglutinin content for paratyphoid A and an apparently good immunity at the end of 12 months. Is this difference between the experimental infection and inoculation agglutinin and the specific inoculation agglutinin following injections of triple vaccine an expression of the group stimulation of the tissues by the action of the cleavage of dead typhoid or para. B bacilli, or due to some other factor? The answer to this query might confirm the practice of combining the three emulsions at one injection or point to the advantages of single and separate injections. We hope to bring forward some evidence bearing upon this problem in a later communication.

The Interaction of the Typhoid and Paratyphoid Agglutinins.

The response to the injection of single vaccines is said to be more rapid than that which follows inoculation with a mixed vaccine. This has been established by Castellani for typhoid and paratyphoid bacilli[2] and by Freeman for typhoid and cholera organisms.[3] But the extent of

TABLE II.

Inoculation Agglutination Units for Typhoid, Paratyphoid A and Paratyphoid B where no Infective Agglutinin was found.

Weeks since inoculation.	Number of cases.	Units 3–15 T.	A.	B.	15–35 T.	A.	B.	35–65 T.	A.	B.	65–150 T.	A.	B.	150–350 T.	A.	B.	350–650 T.	A.	B.	650–1250 T.	A.	B.	1250–2000 T.	A.	B.
		Per cent.			Per cent.			Per cent.			Per cent.			Per cent.			Per cent.			Per cent.			Per cent.		
1–5	6	—	—	—	—	—	33·3	33·3	16·7	11·1	33·3	66·6	33·3	16·7	—	11·1	—	16·7	—	16·7	—	11·1	—	—	—
6–10	18	—	11·1	11·1	5·6	—	—	5·6	33·3	11·1	27·7	33·3	33·3	5·6	5·6	16·7	11·1	—	11·1	44·4	16·7	11·1	—	5·5	—
11–15	38	—	13·2	2·6	2·6	7·9	2·6	—	31·6	18·4	36·8	36·8	37·4	7·9	—	18·4	21·1	5·3	5·3	31·6	2·6	2·6	—	2·6	2·6
16–20	43	2·3	18·6	9·3	4·7	23·2	2·3	18·6	18·6	28	30·3	28	34·9	13·9	9·3	11·6	16·3	—	13·9	13·9	2·1	—	—	—	—
21–25	47	—	—	4·2	2·1	19·2	2·1	27·7	27·7	25·6	27·7	38·3	42·6	10·6	8·5	17	14·9	4·2	2·1	17	2·1	6·4	—	—	—
26–30	55	7·3	14·6	10·9	3·6	10·9	7·3	10·9	30·9	18·2	30·9	23·6	49·1	21·8	10·9	7·3	14·6	7·3	—	10·9	1·8	—	—	—	—
31–35	39	2·6	12·8	5·1	20·5	20·5	12·8	2·6	18	25·6	23·1	28·2	23·1	24·1	10·3	28·3	17·9	—	5·1	10·2	5·1	—	—	5·1	—
36–40	36	2·8	25	19·5	13·9	16·7	8·3	11·1	33·3	22·2	22·2	19·5	41·7	11·1	—	—	22·2	5·5	—	16·7	—	8·3	—	—	—
41–45	11	9·1	9·1	9·1	—	18·2	—	18·2	27·3	18·2	27·3	45·4	54·5	9·1	—	9·1	27·3	—	9·1	9·1	—	—	—	—	—
46–50	9	11·1	22·2	11·1	22·2	—	11·1	22·2	44·5	22·2	11·1	22·2	44·5	11·1	—	—	11·1	11·1	—	11·1	—	11·1	—	—	—
51–55	4	—	—	25	—	50	—	25	—	50	—	25	25	—	—	—	25	25	—	50	—	—	—	—	—
56–60	2	—	100	50	—	—	—	50	—	50	50	—	—	—	—	—	—	—	—	—	—	—	—	—	—
61–65	2	—	—	—	50	50	—	—	—	50	—	—	—	—	—	—	50	50	—	—	—	50	—	—	—
Total number of cases	310	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total percentage for each group of units. Typhoid ...		2·9	—	—	7·5	—	—	13·3	—	—	27·7	—	—	13·7	—	—	17·1	—	—	17·7	—	—	—	—	—
Para. A ...		—	13·6	—	—	15·2	—	—	26·8	—	—	30	—	—	6·1	—	—	4·5	—	—	2·9	—	—	0·9	—
Para. B ...		—	—	9	—	—	5·4	—	—	22·5	—	—	40	—	—	14·1	—	—	4·5	—	—	3·9	—	—	0·6

immunity developed after two or more weeks is the same for single as for mixed emulsions. From the clinical standpoint, however, Coppinger and Gibson found that when the triple vaccine was used the reaction begins earlier and is more intense than when the single typhoid emulsion is injected.

During an acute attack of paratyphoid fever in a man previously inoculated with typhoid vaccine the inoculation typhoid titre is very frequently increased.[1] The figures

TABLE III.—*Inoculation Agglutination Titres for Typhoid Bacilli.*

—	No. of cases.	Units. Under 3	3–15	15–35	35–65	65–150	150–350	350–650	650–1250
Inoculation—With typhoid only:									
1915–16 A.	263	2·4	15·3	29·9	23·2	19·5	5·1	4·0	0·6
1915–16 B.	77	3·9	9·1	15·6	22·1	28·5	13	2·6	5·2
1916–17.	272	10·7	12·5	16·9	16·9	19·5	11	4·8	7·7
With typhoid and para. A and para. B: 1916–17	310	—	2·9	7·5	13·3	27·7	13·7	17·1	17·7

we include in Table III. suggest that an increase in the inoculation typhoid titre occurs also in the presence of inoculation agglutinins induced by the injection of para. A and B bacilli. In 310 men in whose blood there appeared all the three agglutinins, and who had not been the subjects of typhoid-paratyphoidal infection, the typhoid units yielded a larger percentage of high units than were met with in 617 other men who had been inoculated with typhoid bacilli only.

Whether the typhoid agglutinin interacts similarly with the paratyphoid agglutinin production is a problem upon which we cannot offer any evidence at the moment, but the subject seems worthy of inquiry, and we have accordingly instituted experiments towards its elucidation.

Agglutinin Units following the Injection of Triple Vaccine in 356 Men.

The findings so far discussed relate chiefly to the interaction of agglutinins. There remains still the broader question of the general bulk results which have been yielded by sera obtained from men inoculated with the triple typhoid, para. A and B vaccine. Here we have considerable difficulty in presenting any complete survey, as it has not been possible always to obtain a precise account of the type of vaccine injected. Making use, however, of the general statement that the triple vaccine came into widespread employment in the early days of 1916, we have been able to present a rough account of the agglutination units determined. Had we been dealing with the acute phases of the diseases which caused the home-coming of the men, we should have found it more easy to place certain anomalous instances within definite categories. It was necessary to rely on experience and intuition in these cases to a greater extent than we care to do, but it seems worth while, perhaps, to attach Table IV. as a rough estimate of the success and failure of response to the triple vaccine. The negative findings are placed under the heading of "Less than 3" units of agglutinin, although the majority of these failed to give agglutination in dilutions of 1 in 10 serum. Speaking generally, the typhoid negatives are fewer than those met with after the injection of the single vaccine, while those following para. A and B are more numerous.

TABLE IV.

Agglutination Units after Use of Triple Vaccine ... 356 men.

		Per cent.
Cases showing triple inoculation agglutination units ...	310	87·1
,, in which typhoid yields under 3 units	1	0·3
,, ,, Para. A ,, ,, ,, ...	15	4·2
,, ,, Para. B ,, ,, ,, ...	30	8·4
Total	356	100

Relation of Low Units to Weeks since Inoculation.

Weeks since inoculation.	Typhoid.	Para. A.	Para. B.	Weeks since inoculation.	Typhoid.	Para. A.	Para. B.
6–10	—	1	1	36–40	—	2	1
11–15	—	2	2	41–45	—	0	2
16–20	—	1	10	46–50	—	1	—
21–25	—	2	5	51–55	—	1	—
26–30	—	3	4	56–60	1	1	—
31–35	—	1	5	Totals	1	15	30

We thank Lieutenant-Colonel J. P. Bush, C.M.G., Lieutenant-Colonel J. Michell Clarke, and the whole of the staff of the Second Southern General Hospital, for the facilities they have so kindly provided.

Summary.

1. Additional observations upon the inoculation agglutinins following injection of killed typhoid bacilli are recorded. They confirm previous statements.

2. The agglutinin content after injection of the triple vaccine shows the response to be as persistent as when the single vaccine is employed. The units for paratyphoid A are the lowest, next comes paratyphoid B, and finally typhoid bacillus.

3. When compared with the results following inoculation with *B. typhosus* only the use of the triple vaccine is associated with an increased number of typhoid agglutinin units.

4. These findings in bulk confirm for man the observations which Dreyer and Ainley Walker record in their

experiments upon rabbits—namely, that after immunisation with dead *B. coli*, the subsequent injection of killed emulsions of *Staphylococcus aureus*, the bacillus of Friedländer, or a streptococcus increases the production of the specific primary agglutinins, so long as the animal retains any measurable degree of acquired immunity.[1] Perhaps the figures may be interpreted so as to carry the matter a little further and to suggest that inoculations with allied, or group, organisms point to the probability that typhoid and paratyphoid bacilli differ so much in their essential metabolism as to classify them individually as heterologous organisms. The results of our previous absorption experiments and their inferences as to the absence of co-agglutinins in sera containing mixed antibodies lend support to the surmise.[1]

Literature.—1. Walker Hall: Journal of R.A.M.C., September, 1916 (with literature). 2. Castellani: Soc. of Trop. Med. and Hyg., November, 1915. 3. Freeman: Ibid. 4. Coppinger and Gibson: Journal of R.A.M.C., 1916, p. 581; and Harvey and Gibson: Ibid., 1915, p. 525; and Cummins and Cumming: Ibid., October, 1912, and September, 1913. 5. Dreyer and Ainley Walker: Journal of Path. and Bact., xiv., 30. 6. Hachtel and Stoner: Journ. of Infect. Diseases, 1916, 19, p. 322.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF VINCENT'S INFECTION INVOLVING MOUTH, EYES, AND PENIS.

BY F. B. BOWMAN, M.B. TOR.,
MAJOR, C.A.M.C.; O.C. NO. 2 CANADIAN MOBILE LABORATORY.

SINCE publishing a preliminary report on "Infectious Stomatitis among Troops" in 1916[1] many cases of this serious condition have been seen. That cited here would seem to be of sufficient interest to warrant an individual report.

Case history.—Captain ——, aged 30. Always had good health until the present illness occurred. About March 1st, 1917, he noticed that he began to lose his voice. He does not describe any pain in connexion with this, but it seemed to be due to a sense of constriction in the throat. The glands in the neck were not tender. The condition gradually became worse, and on March 15th, when instructing a party in trench work at night, he had a severe chill and a cough developed. He then noticed soreness of the eyes with watering, and had great tenderness of the gums. On March 19th he was admitted to hospital.

Examination on admission.—Temperature 102° F. Greatly depressed, feels chilly, and can eat nothing but fluids because of the soreness of the lips and inside of the mouth. He was seen by me on March 21st. Examination showed a very severe conjunctivitis, with a large amount of thin discharge present containing flakes of whitish material; the conjunctivæ were red, a certain amount of photophobia present. The mouth was half opened and the lips covered with angry herpetic-looking ulcers, some of which were covered with a fragile whitish membrane. These seemed to be confined to the lips, and had not extended to the surrounding skin. On account of the pain it was impossible to open the mouth, and it was very difficult to retract the lips. The gums were reddened, the teeth bathed in pus, and pressure on the gums caused severe bleeding. The hard palate was covered by a whitish membrane, which came away easily, leaving a bleeding surface. The throat, which could be seen only partially, was covered with a membrane also, but there was no evidence of any deep ulceration. Smears were made from the eyes and from the ulcerated areas in the mouth, as well as from the gums. These showed large numbers of Vincent's organisms (spirochætæ and fusiform bacilli).

A mixture of arsenic and ipecac., as recommended in a previous paper, was used three times daily as an application to the gums and lips, and also as a mouth wash. Boracic compresses were advised for the eyes. In 24 hours the mouth felt "easier," although it was impossible to open the lips. After three days from the time that I had first examined him the patient confided in me that he had a peculiar sore on the penis, and this on examination was found to be a small red ulcer with a membrane over it surrounding the meatus. Smears showed Vincent's organisms present in large numbers. For treatment the same solution as that used in the mouth was applied on a small pad of cotton-wool, and changed three or four times a day. The ulcerated area was completely healed within a week. The Wassermann reaction was negative on two occasions. During the second week after admission the patient developed a severe pleuritis, with a fairly large amount of fluid present; but this apparently was simply coincident, and had no relation to the other conditions described here, although the chill and cough, which developed early in the disease, were the first signs of pleuritis.

When last seen by me the mouth, eyes, and penis were entirely healed, and the marked depression which was present at first had disappeared. This was one month after his admission to the hospital.

Summary.—The case reported here is particularly interesting from the fact that three separate and distinct areas covered by mucous membrane were infected by Vincent's organisms. The primary infection was probably in the mouth and had been transferred to the glans penis and conjunctivæ by means of the fingers. Treatment with the following prescription as a mouth wash, with directions that the mixture should not be swallowed, quickly cleared up the condition:—

R	Vin. ipecacuanhæ	...	...	℥ ss.
	Glycerini	...	...	℥ j.
	Liq. arsenicalis	...	ad	℥ j.

[1] Proceedings of the Royal Society of Medicine, 1916, vol. ix. (Medical Section), pp. 51–60.

ANOTHER CASE OF MALARIA CONTRACTED IN ENGLAND.

BY R. LOY WILCOX, M.R.C.S., L.R.C.P. LOND.,
SENIOR ASSISTANT MEDICAL OFFICER, PARK HOSPITAL, LEWISHAM, S.E.

G. T., aged 20 years, had an abdominal operation at Salonica for wounds received in action on Nov. 28th, 1916, but has been in this country for over three months. He was admitted to the Park Hospital certified to be suffering from scarlet fever on July 27th, with the history of vomiting and sore-throat on the previous day.

On admission he had a faint punctate erythema, the tongue was heavily furred, and the fauces were swollen and injected. The temperature was 104°F., but there was no rigor. The temperature continued irregular and at midnight July 30th–31st was 104°, but again there was no rigor. It was normal on the morning of July 31st and remained normal until 7.15 P.M. on August 1st, when the first rigor occurred, the temperature rising to 104°. By midnight it was normal again. A careful examination of heart and lungs revealed nothing abnormal.

On August 3rd, at 2.30 P.M., he awoke from his sleep and asked for a hot drink, as he thought an attack was coming on. A rigor followed immediately, and then malaria was thought to be the cause of the trouble, and the man, who had previously been taking sodium salicylate, was put on quinine sulphate 3 gr. every four hours. Another rigor occurred on the 5th, and the dose of quinine was increased to 6 gr. every four hours. Afterwards there were no more rigors and the man rapidly became convalescent. On the 9th the dose of quinine was reduced to 3 gr. every four hours, and on the 13th it was omitted altogether. A blood film taken during the height of an attack was kindly examined by the pathologist of the military hospital from which the man came and he reported that the tertian parasite was present.

The rash present on admission disappeared in a day or two and as neither the tongue showed any trace of peeling at any time nor was any desquamation seen the diagnosis of scarlet fever was abandoned and the man discharged well on August 21st.

I am indebted to Dr. T. F. Ricketts, medical superintendent, for permission to publish this case.

THE Local Government Board has approved of the appointment by the Bournemouth town council of Mr. William Bertram Lawrence as tuberculosis officer for the period of the war, subject to his services not being further required by the War Office.

MEMORIAL BED TO THE LATE MR. JOHN PLATTS.—As a memorial to the late Mr. John Platts his sister and legatee, Mrs. M. A. Shipley, has endowed a bed in the wards of the Leicester Royal Infirmary. Mr. Platts was a well-known representative of the firm of Messrs. Southall Brothers and Barclay, manufacturing chemists, Birmingham, and for many years was closely associated with medical work in the neighbourhood of the hospital. This fact is recorded on a memorial plate over the bed.

Reviews and Notices of Books.

The Thyroid Gland in Health and Disease. By ROBERT MCCARRISON, M.D. R.U.I., D.Sc. Belf., F.R.C.P. Lond., Major, Indian Medical Service; Lauréat de l'Académie de Médecine, Paris. With numerous illustrations. London: Baillière, Tindall, and Cox. 1917. Pp. 286. Price 12*s.* 6*d.* net.

FROM the time of Hippocrates and Aristotle onwards impure drinking water has been held by the majority of physicians to be the cause of goitre. But it is only within comparatively recent years that we have approached a precise knowledge of the ultimate causes of disease of the thyroid-parathyroid glands by the correlation of facts and inferences based upon the results of experiments upon animals, clinico-anatomical observations upon man, and epidemiological investigations. It is a great satisfaction to recall the fact that many British physicians and physiologists have acted as pioneers in important contributions to our knowledge of the thyroid gland in health and disease, and we welcome this latest valuable pioneer work of Major McCarrison, which sets forth in a lucid, comprehensive, and interesting manner a subject which he has studied experimentally, epidemiologically, and by clinico-anatomical observations for the past 14 years. During this time he has contributed numerous original papers to medical journals and societies, including the Proceedings of the Royal Society, bearing upon goitre and allied subjects. Major McCarrison speaks authoritatively as a physician of experience, and throughout all three parts into which the work is divided there is exhibited a most extensive knowledge of the literature.

The first section deals with the thyroid and parathyroid glands in health; the second with the factors which cause them to depart from health; and the third with the morbid states of goitre and cretinism, tetany, myxœdema, and exophthalmic goitre. In the appendix there are two series of cases showing the effects of intestinal antiseptics on goitre, as well as a brief summary of the author's more noteworthy epidemiological and experimental observations.

In reviewing this important contribution to medical literature we shall best serve the interest of the profession by briefly referring to Major McCarrison's conclusions regarding the causation, prevention, and treatment of endemic goitre, a subject of great importance, seeing that "in India at the present time there are not less than five million persons afflicted with goitre, while half a million is a low estimate of the number who suffer from its congenital manifestations." It was generally believed that permanent hardness of the water was the cause of goitre—e.g., Derbyshire neck was attributed to this; while not denying that it may be to some extent a contributory factor, Major McCarrison's observations show that it is not an essential cause. Within recent years the many theories as to the causation of endemic goitre have been reduced to the following: (1) Chemical ingredients of drinking water; (2) geological peculiarities of the soil, imparting to the soil a specific colloidal poison; (3) faulty nutrition; (4) living micro-organisms. The author claims that his experimental and epidemiological observations prove that living organisms are the essential cause of the disease, and he puts forward the following premises as proof that fæcal contamination of the water-supply by a living and specific micro-organism is the cause of goitre. 1. In villages where goitre prevails this disease shows a steady increase in proportion to those conditions which increase the impurity of the water by fæcal contamination. 2. He claims to have produced goitre experimentally in man by ingestion of the residue left on the candle of a Berkefeld filter after filtration of goitrigenous water. This residue when boiled does not cause goitre. 3. The administration of beta naphthol and thymol and other intestinal antiseptics may cause the disappearance of the goitre in young subjects. 4. The researches on trout by Marine, Lenhard, and Gaylard demonstrate that fish confined in tanks one above the other on a single water-supply exhibit an increasing thyroid hyperplasia in the series from above down. 5. He claims to have produced goitre in rats and goats by feeding them on fæcal material from goitrous and even non-goitrous subjects; also from cultures, aerobic and anaerobic. The anaerobic are the more potent. 6. Congenital goitre with cretinism and parathyroid disease can be produced experimentally by feeding the mothers throughout pregnancy with these cultures. Photographs of men and animals and photomicrographs of sections of the glands are given. Finally, Major McCarrison claims that vaccines prepared from intestinal organisms are capable of causing the disappearance of recent cases of goitre when injected in appropriate doses at weekly intervals. We are of opinion, however, that further observations will have to be made before the value of autogenous vaccines in the treatment of goitre can be accepted as proven. With regard to the infective organism, Major McCarrison claims that it lives in the soil of infected localities, and particularly in soil which contains a high proportion of organic matter of human or animal origin. It seems that "the great source of the disease is the infected individual, and that he is the producer, the reservoir, and the distributor or 'carrier' of the infecting agents." The author, therefore, implies that there is a specific organism capable of producing goitre, which exists in man living in districts where goitre is endemic. This organism has not been isolated and obtained in pure culture; in fact, the observations on trout would seem to point to the fact that normal organisms of the fæces passing through the intestinal canal of this fish acquire an increased toxic influence on the thyroid gland. In the author's experiments on rats he states that ingestion of fæcal material from even non-goitrous subjects will produce goitre, which rather militates against his experiments, proving that there is a specific goitrigenous infective organism. Major McCarrison has shown that in mountain villages where one is situated above another there is a correlation between the increase of fæcal contamination of the water-supply and the prevalence of goitre. Might it not be worth while to make plate cultures and counts of the different fæcal organisms in the water-supply of a series of such villages? It would also be of interest to ascertain whether there was any modification, morphological or cultural, in the organisms found in the water-supply to the villages where goitre is most prevalent.

It is interesting to note that the author does not consider that Graves's disease is the direct outcome of the flooding of the organism with thyroid substance, as it is stated to be by Biedl. According to Major McCarrison, it is not the escape of excess of the thyroid secretion which is at fault, but a bacterial toxin which stimulates the gland to increased activity. The remedy, therefore, is to seek the source of the bacterial toxin and eliminate it. He enters a protest against the tendency of some surgeons to operate in all early cases as a routine procedure.

We can cordially commend this valuable work, so rich in original thought and observation. Naturally all the links of the chain of evidence upon which our present knowledge of thyroid-parathyroid disease is founded are not of equal strength and probable durability. Some of the links contributed by the author will require strengthening by further investigation and by confirmation of independent observers.

The book is interesting in style and lucid in exposition, is well printed and illustrated. We congratulate the author on having made a noteworthy contribution to British medicine.

LIBRARY TABLE.

Daily Drill for the Voice. By ROSE I. PATRY. Published by the author at 3, Lower Seymour-street, Portman-square, London, W.—In this pamphlet on voice management Miss Patry has done a sound and useful piece of work. The want of skilled attention for sufferers from shell-shock has been keenly felt by those coming in contact with them. There is not only the need for medical help, but for help from persons skilled in voice-production and voice-correction. There are difficulties in the way of supplying the latter kind of assistance to many of the victims who require it most, and the possibility of helping themselves, as indicated in "Daily Drill for the Voice," will be most useful information. The book contains six groups of exercises for control of breath, voice, and body, graded with obvious precision. Exercises in regular control of the breath and in use of the voice are combined with movements of the arms, ribs, chest, and with such ordinary movements as writing, walking, rising from a seat, so that the recovered or corrected voice is from the first placed in the circumstances of

daily life. Care, too, has been given to the amount of mental effort required in performing the exercises, the early ones being more mechanical than the late ones. One point that might offer some difficulty to the inexperienced reader is the exact meaning of "the initial sound" of a consonant. A list of the phonetic sounds as used in the pamphlet might with advantage have been added to the introductory directions and so have removed any doubt on the part of the learner. Thus we should have had explained such an exercise as "Make the shape of the mouth of the following consonants ..... W, W, W. ....." To the uninitiated what is the shape of the mouth for "W"? The pamphlet contains no exercises dealing with such sounds as "th," "sh," "ch," "j," or difficult combinations, e.g., "pl," "gr," "st," "sk," which leads us to suggest that Miss Patry should produce a sequel in the shape of a series of exercises of a higher standard of difficulty. Meanwhile any soldier or sailor whose speech is affected may derive invaluable benefit by using "Daily Drill for the Voice."

A Farmer in Serbia. By ELLEN CHIVERS DAVIES. London: Methuen and Co. 1917. Pp. 248. Price 6*s.* net.—This is a very readable book, composed to some extent of articles which have been contributed to the *Manchester Guardian*, the *Morning Post*, and the *Yorkshire Post* enlarged into a diary, bearing dates from the first summer of the war until the time when Bulgarian defection led to the over-running of Serbia by the enemy. The book tells an interesting and pathetic story simply but quite poetically. It is easy to realise the beauty of the scenes in which many of the struggles were enacted, as well as to comprehend what a horrible tragedy it was that the Allies were unable to make good the Serbian resistance. The proceeds of the sale of the book will be given to the Serbian Relief Fund.

Health Survey of New Haven. Yale University Press, New Haven, Connecticut. 1917. Pp. 144. Price 75 cents net.—This Survey was prepared at the request of the Civic Federation of New Haven and is now published in pamphlet form by Yale University, the cost being defrayed from the Anna M. R. Lauder Memorial Foundation in the Yale School of Medicine. The record of an exhaustive sanitary survey is extremely practical, and each description of existing positions is followed by a definite recommendation where a method of reform has suggested itself to the authors. The one essential need made clear by their investigations is that of providing the health department of the city with six efficient and well-qualified divisional directors, who could supervise the work of their subordinates and aid the health officer in the organisation and development of particular lines of energy. The expansions of the work of the department of health which appear cardinally essential to the authors include the re-arrangement of the work of the Board of Health, the strengthening of the various staffs with a more reasonable division of their labours, the reorganisation of school inspection with the provision of school clinics, and the appointment of an expert on tuberculosis to develop a campaign against the disease. The cost of the suggested additions are estimated at about £7000 a year, an increase of per capita expenditure for health work in the city from 26 to 48 cents annually. This strikes us as being a remarkably moderate figure. The public health authorities of English cities having a comparable population of something between 100,000 and 150,000 might with advantage study this well-arranged pamphlet. All the modern problems of preventive medicine receive notice, and in many places there are indications for reform which would be as applicable in a British as in an American city.

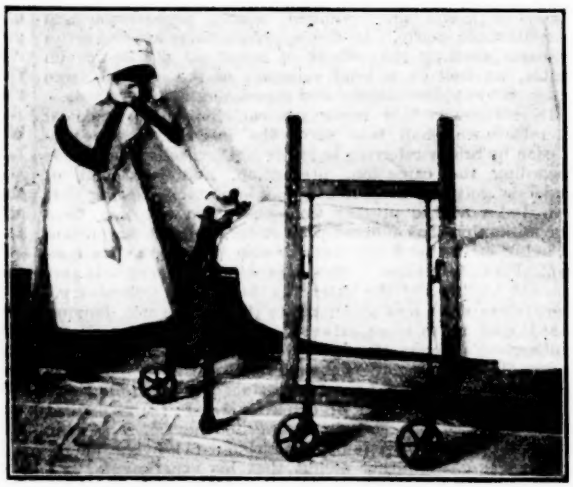
Manual of Chemistry. By W. SIMON, Ph.D., M.D., and DANIEL BASE, Ph.D. Eleventh edition, thoroughly revised. London: Baillière, Tindall, and Cox. 1917. Pp. xvi. + 648. Price 18*s.* net.—In the preparation of this edition the chief change made has been the omission of the chapters on light and electricity of the previous editions, though the articles on the spectroscope and the polariscope have been retained, since their applications in analytical work are indispensable. This course has made room for much new matter, particularly in the first subdivision of Section II. dealing with the non-metals. In this section some space is given to an account of reversible reactions and chemical equilibrium. In previous notices of this book we have always expressed an appreciation of its clearness of statement, its logical sequence of facts, its remarkable coloured illustrations of tests, and its general soundness on both theoretical and practical questions. The student in the laboratory will find this book of considerable service, even though he be a beginner.

A Laboratory Manual of Organic Chemistry for Medical Students. By MATHEW STEEL, Ph.D. New York: John Wiley and Sons, Inc. London: Chapman and Hall, Limited. 1916. Price 6*s.* net. Pp. 193.—A useful series of tests is here given for more or less familiar organic substances, setting forth their properties as well as those reactions which serve for their detection. Particular attention has been given to the selection of experiments which are of special interest to medical students. The sections on alkaloids, proteins, amines, and amides are the best examples of this plan. In the directions given in making the tests the use of definite quantities of reagents is enjoined, which has the double advantage of obviating waste of material, and of securing a satisfactory response to the test. The book presents a sound practical course of laboratory teaching confined to organic substances.

New Inventions.

THE "TOWNSEND-LOCK" BED LIFT AND TRANSPORTER.

RECENTLY we noticed two devices for moving the sick and their beds. We here describe a bed lift and transporter which is the invention of two members of the Inquiry Bureau of the 2nd Southern General and Beaufort War Hospitals, Bristol, and their Auxiliaries. The apparatus is simple, light, strong, and effective, and affords a ready means of wheeling a patient in bed, without any jarring or discomfort,



into the open air, even over grass or uneven ground. As will be seen from the illustration, the invention consists of two square frames (one for the head and one for the foot of the bed) running on swivelled rubber-tyred wheels. The frames are hooked under the top bar of the bed which is levered up by pushing forward the bottom of the frame. The frame is then clamped securely in position by hooks sliding on its face. No lifting is required, the leverage being equal to any normal load on the bed, and the adjustments can be made in about 15 seconds. The apparatus is adjustable, and can be fitted to almost any ordinary hospital bed.

Any proceeds resulting from the commercial use of this invention, which is priced at £4 10*s.*, will be devoted to the funds of the Inquiry Bureau. Only one set of frames is required for any number of beds.

Further details may be obtained from the Honorary Secretary, Inquiry Bureau, 39, Broad-street, Bristol.

THE LANCET.

LONDON: SATURDAY, OCTOBER 6, 1917.

The Treatment of Wounds in War.

Professor W. W. KEEN has not been at the front, but in his eightieth year he is a surgeon of large experience and breadth of view, and his report[1] on the treatment of war wounds, compiled at the request of the National Research Council of America, will be studied with profit by many whose daily work brings them in contact with the wounds of war and with the controversies thereon arising. The Atlantic, while reducing magnification, may at the same time improve perspective. After three years of fighting the number of different methods of treating wounds is still so great as to prove that there can be no one preferable technique, and this would be expected when we remember the diversity of circumstances and environment in which the injuries are inflicted. General principles may evolve, though a one and only procedure need not be expected. But many of the new remedies brought forward during the war have been acclaimed by their inventors as almost a panacea for all sorts and conditions of wounds, and that there is no small amount of truth in many of the claims that are made proves simply that in dealing with an enormous mass of wounded material large groups having similar manifestations have been found. Various new conditions have been met with, and the new lines of treatment have been devised for the most part to deal with these new conditions. The sepsis seen in many of the wounds in the present war is of a virulence rarely if ever encountered in civil practice and almost unknown in previous campaigns. Gas gangrene and tetanus were rife in the early months of the war. The long interval between the infliction of the injury and even the first dressing, which in some sections of the line was bound to occur, led only too often to the penetration of microbes deeply into the wounds; and when close trench war prevailed everywhere great difficulties were experienced in bringing in the wounded. But now that the movement on the western front, which we are considering to-day, is towards the east always, so that the ground over which the advance is being made remains in our hands, the wounded receive aid much earlier than was formerly the case, and some of the older problems have disappeared.

The skill and inventiveness of the army surgeons, their civil colleagues, and the pathologists have been exercised to the utmost, and the results of treatment have steadily improved. Tetanus has almost disappeared; every wounded man receives one or more doses of antitetanic serum as a matter of routine, and the effect is intensely striking to all workers in military hospitals. The treatment of gas gangrene presented what our American allies would term "a tough proposition." Various methods were proposed and tried, but until recently—sad to think!—the safest treatment too often was to perform a flapless amputation, so that the perfect drainage and the exposure of the anaerobic organism to the air led to its elimination. Now the claim has been made for a new serum that it will deal as effectively with gas gangene as the tetanus antitoxin deals with tetanus. If this claim should prove well founded, a valuable addition will have been made to our armamentarium, and we hope that further work in this direction may clear up all the doubts. For the treatment of wounds infected with the ordinary pyogenic organisms many procedures have been devised. One of the most valuable methods of lessening the sepsis, and one which often permits of healing by first intention, is excision of the wound so that a large proportion of the entrant micro-organisms is mechanically removed; while the tissues damaged by the toxins are taken away, and clean healthy tissues are brought together. Even though a true union by first intention may not always be obtained, yet the suppurative process is immensely weakened, and healing is promoted. The whole work of Sir ALMROTH WRIGHT in these directions has tended towards simplification and towards a scientific comprehension of the underlying pathology of the conditions met with. For the treatment of wounds which have already become infected, but cannot from their extent be excised, Sir ALMROTH WRIGHT'S researches have been invaluable, while two methods have emerged to which the authors' names have been properly attached. CARREL'S method of using Dakin's hypochlorite solution, and RUTHERFORD MORISON'S employment of "B.I.P.P.," although differing widely in the means employed, are both undoubtedly effective in preventing and reducing sepsis in wounds, and each has proved useful in promoting their healing. By the Carrel method it is claimed that in nearly all cases of wounds in which the infection has not progressed too far it is possible by the regular instillation of the hypochlorite solution to render the wound germ-free within a week or two, and the asepsis is guaranteed by a bacteriological test; and when this aseptic stage is reached the wound may be sutured and it will heal without suppuration. The Carrel method is the only one described in detail by Professor KEEN, as, judging by published statements, he finds the results superior to those of any other method. The work of Dr. A. DEPAGE on compound fractures at La Panne has specially impressed him. The "B.I.P.P." treatment consists in filling the wound with a paste of bismuth subnitrate, iodoform, and paraffin, and when it is closed with sutures in many cases the wound heals rapidly with a minimum of suppuration.

In the present issue of THE LANCET appears a paper by Major JAMES PHILLIPS, R.A.M.C., who has worked at the Bradford War Hospital, and from a study of the various forms of treatment he has evolved the "Bradford method," with which he has

[1] The Treatment of War Wounds, by W. W. Keen, M.D., LL.D., Emeritus Professor of Surgery, Jefferson Medical College, Philadelphia. W. B. Saunders Company, 1917. Price $1.75.

obtained excellent results. It is essentially a combination of these two methods, the Rutherford Morison and the Carrel treatment, preference being given to the one or the other according to the lesion, and sometimes the two are employed in turn. Success depends not only on the actual method itself, but also on the application, and this is why the inventor of a new method may obtain results superior to those of others. If a surgeon is working on lines in which he does not believe, it is unlikely that he will meet with success; he does not carry out instructions with the care and thoroughness that he would use if he believed absolutely. Little details vital to success will be omitted or imperfectly carried out, and the method will be dismissed as of little or no value. At the first introduction of antiseptic surgery surgeons who did not believe in it condemned it as useless, "for," said they, "we have used carbolic acid in the wound and pus was formed as usual," forgetting or ignoring that the principle of antiseptic surgery is not merely the employment of carbolic acid. There is no finality in surgery, and we certainly have not reached any finality in the treatment of wounds in war; but it is certain that in the past three years we have learned much of the treatment of these wounds, we have been able to save life and to prevent much pain and delayed healing.

Air-Raid Psychology and Air-Raid Perils.

IN certain schools of biological thought, as we had occasion to point out when discussing the subject of air-raid psychology a few weeks ago, a favourite theme is the adaptation of the organism to repeated sense stimuli of a given type, whereby appropriate reflex action by way of defence or otherwise is installed. Now the aerial bombardment of crowded cities is a recent development of "civilised" warfare; our sense organs have not in any general manner become adapted to the stimuli, with the result that, among the population taken in mass, definite defensive behaviour has not been evolved as a normal course. But although it would be too much to expect that in so short an experience of aerial bombardment the public conduct should have devised at once the wisest courses of action in circumstances which are not only very trying in themselves but very diverse in their dangers, yet it may be claimed that in London and its environs the inhabitants have already gone a long way towards behaving in bulk with bravery and prudence. It is a truism that a crowd is impulsive and mobile, but their common impulse and consequent movement, when properly directed, spread rapidly, grow wiser and stronger as they spread, and tend to shape the behaviour of the more unstable members with a force that is augmented by geometrical progression. London behaved well at the beginning in face of the new perils, and the beginning is being justified by the sequel.

London during last week endured five aerial raids of varying severity, and each of those raids had as furious an intent as any of the others. During this week, as we write, London has been the objective during two nights of similar exhibitions of frightfulness, and there is not a doubt that the immense populations involved have learned with speed and uniformity lessons which have saved many lives, which will save more lives, and which—this is of infinite importance—have enabled them to analyse their dangers, estimate the severity of those dangers, and front them therefore with that spirit of comprehension which is the basis of fortitude. The experiences of London happen to be our text, but they exemplify, of course, the experiences of all centres of aerial attack. At the present moment London is to the enemy the symbol of our national might and its inflexible resolves, and is, therefore, the object of their most determined onslaughts; but lessons learnt from events in London are applicable throughout the zone of war. The people of London, including those of the densely-populated rings without London proper, now appreciate that their risks can be divided into two—namely, those from the bombs of the enemy and those from the defensive gun-fire; and they know, further, that by as much as the hideous din and luridly magnificent atmospheric effects constitute the most terrifying stimuli to their senses, by so much is fear misplaced, because it is the work of our defensive machinery, as the enemy in vain tries to penetrate, which accounts for nearly all which they can hear or see. The Home Office has drawn up a leaflet containing a summary of the advice which has been given so far to the public, with the additions and modifications which events appear to justify. An intelligent reading of this leaflet proves how small are the risks to which the bulk of the population is submitted from the supreme danger of being bombed by the enemy, but how great are the chances of catastrophe from the avoidable risks accompanying our own defensive activity, while it is this activity which rings us round for long periods and on repeated occasions with the tumult of hell. Almost all of what we hear and what we see—and the less we try to see anything the better—amount to sound and fury, and although they are far from signifying nothing, the simple precaution of taking cover leads to probable safety.

The evidence of medical men who reside in the attacked centres or who have been present quickly on the scene of an accident, or who have been summoned to attend the victims of shock, all goes to show that the inhabitants of London have steadily improved in courage and calm as they have learnt the measure and the sources of the dangers to which they are subjected; and we are glad to state positively that among those whose natural anxiety has been greatest—and there is not a soul among us who does not feel anxious during an aerial attack for himself as well as for those nearest and dearest to him—the power of recuperation has manifested itself with great rapidity. The recurrence of the dangers has tended not to exaggerate those dangers, as the enemy hoped fondly would happen if attack followed often upon

attack, but rather has made the circumstances more tolerable; and it is this growing bravery which has become a feature of our psychology, and which accounts for the fact that a short relief from strain is almost invariably followed by a complete recovery of balance.

Training in Citizenship.

THE prophylaxis of responsibility has never been a success in this country and the adolescent boy or girl exposed to the full brunt of independence without any previous experience often succumbs to attacks of wrongheadedness, with results which may in one social class lead only to distressful family relations and in another to collision with external authority. The recent outbreak of juvenile crime is an example of the latter which cannot be set aside as a matter solely for punitive action. The Bishop of BIRMINGHAM in a recent letter to the *Times* describes with accuracy and restraint the nature of the complaint and goes on to put his finger upon its cause. Reasonable obedience to authority and regard for the demands of the social necessities of the community are, he says, almost dead in the vast mass of the youth of the land, as a natural and inevitable consequence of the fact that the growing girl and boy receive little assistance in any direction towards a training in citizenship. This has been the prime failure in the national education of the present time, and the result is just as inevitable as the exposure to measles of a community which has had no training in protection against it. Dr. WAKEFIELD considers—and all thoughtful people will agree with him—that an effective training in citizenship is an essential part of elementary education. But it is no use now relying upon a future educational system which will come too late to be effective for the upgrowing generation, even if it accomplishes something useful later on. He therefore suggests a combination of existing organisations dealing with young people for the purpose of conference and combined action. The response already made to his letter shows that some at all events of these organisations are keenly alive to the need of action, which is indeed imperative for the satisfactory solution of the myriads of after-war problems.

THE Harveian Oration of the Royal College of Physicians of London will be delivered at the College by Dr. Robert Saundby, at 4 o'clock, on Thursday, Oct. 18th.

LITERARY INTELLIGENCE. — Lord Rhondda will contribute an introduction to the new edition of Sir William Crookes's book on "The Wheat Problem," which Messrs. Longmans will shortly publish. An additional chapter on Future Wheat Supplies has been contributed to the book by Sir R. Henry Rew, K.C.B.

WAR EMERGENCY FUND OF THE ROYAL MEDICAL BENEVOLENT FUND.—At a meeting held in London on July 31st last it was decided to hold a general meeting of the medical profession in October in order to nominate a representative general committee and to discuss the best methods of promoting this appeal. This meeting has now been arranged for Wednesday, Oct. 10th, at the Medical Society's Rooms, 11, Chandos-street, Cavendish-square, W., at 5 P.M. It is hoped that the meeting will be largely attended in order that the appeal may be well supported and made widely known to the medical profession and the public. Lieutenant-Colonel Sir Alfred Pearce Gould, K.C.V.O., will preside.

Annotations.

"Ne quid nimis."

INSINCERITY IN CASES OF WAR INJURY.

A RECENT number of the *Paris Médical* contains an essay on insincerity as a feature of certain cases among the wounded which, though its conclusions are admittedly tentative, forms an interesting attempt to clear the air and facilitate further investigation. The authors, M. Laignel-Lavastine and M. Paul Courbon, are in charge of the centre, under the military government of Paris, for the examination of soldiers who, in the absence of evidence of organic disease, are suspected of "ill-will." They divide functional states into two groups: in the first the patient is unaware that he is the originator of the troubles of which he complains, and is therefore sincere in making himself out to be ill; here are placed those psychoses characterised by impairment of the critical faculties, notably hysteria. In the second group the abnormal functional manifestations are directly dependent on the conscious "mauvaise volonté" of the patient; to be consciously aware of being the cause of his own complaint is the mark of the simulator. In the latter case the physician, recognising the illegitimate nature of the symptoms complained of, may distinguish three categories: (1) somatic disturbances, comprising mutilation and "pathomimia," or the artificial concoction of a diseased condition; (2) functional disturbances or simulation properly so-called; (3) functional disturbances grafted on a genuine organic affection, including exaggeration and perseveration. The diagnosis of malingering is really a psychological problem; in other words, the question is whether the patient has or has not the intention of deceiving. Now to detect an individual's intention is notoriously difficult; it is perhaps more prudent, therefore, merely to say, in a particular case, that there is no reason why the symptoms should not disappear. But this attitude is obviously unsatisfactory when dealing with such cases as M. Laignel-Lavastine and M. Courbon have under their care; their task is to search the reins and the hearts and to face the risk of making mistakes. If to ourselves our inner man is the sport of involuntary or unconscious deceits which render an exact determination of our motives all but impossible, how can we hope to settle analogous questions in others? The answer is that precisely this intimate deception does not impose or has less power of imposing on the outside observer. Experience shows there are constitutional peculiarities in different individuals which determine the variations in their intention to deceive. There is the pure simulator or malingerer, without apparent excuse, who does not wish to risk his life or to undergo the fatigues of warfare. Among the numerous types who advance some excuse may be distinguished the emotional simulator, who thinks he could never bear the sights of the battle-field; the hypochondriac, who thinks his physique would not stand campaigning; the man who pretends he would be more useful in less-exposed positions, or declares he has already "done his bit," or excuses himself by instancing the good fortune of some comrade. Often, too, the patient begins to malinger at the instigation of his family or continues to do so to prove to the physician he has

been wrongly accused of simulating. It must be admitted that occasionally therapeutic maladroitness suggests to the patient the idea of perpetuating his troubles, of the nature of which he was at first unaware. Exaggeration is very frequently observed; perhaps the commonest is that where the exaggeration is scarcely conscious. That symptoms may vary with the attention paid to them is not necessarily an indication of conscious deceit. The authors discuss with some minuteness the forms that simulation actually takes once the idea has occupied the patient's mind. They describe the active malingerer, who usually defeats his own purpose by challenging the observer's diagnostic power; the apathetic, who with oriental fatalism makes no reaction against the idea that he is ill, and who perseveres till the physician is exhausted; the sensitive, who eagerly falls in with the suggestions of the doctor and agrees readily enough that there is nothing the matter, yet persistently fails to throw off the influence of some trifling emotional factor. With this sensitiveness is associated a sort of mental dilettantism, which is especially noticeable in those who have already been at the front, arriving home again it may be for some genuine though temporary condition. The authors give a picturesque, yet none the less accurate, account of the devices to which the simulator has resort, and of the assumed attitudes of injured innocence, or of suspicious politeness, or of spurious anxiety to help in the unravelling of their case.

A COLOUR WARD.

Mr. H. Kemp Prosser holds the opinion that the colour of the surroundings has an enormous effect on the recovery of the sick, especially those who are depressed for one reason or another or are suffering from shell shock. An opportunity has been afforded him for carrying out his ideas by Miss McCaul, who has placed at his disposal a small ward in the McCaul Hospital in Welbeck-street. This ward he has had decorated according to his theories and the result is certainly very pleasing. He claims that it is of the first importance to remove from the patient the idea of being shut in, an idea which is truly often a cause of great worry to some sufferers. Therefore he paints the ceiling a bluish colour, so as to resemble so far as possible the blue of the sky, and the tint he employs he calls "firmament blue." This blue is also used for a wide frieze. The walls are painted a greenish yellow to represent the colour of foliage in spring, and the tint is called "Sunlight Primrose." A narrow slip of darker green separates the blue of the frieze from the walls. The floor is painted with a yellowish green, containing certainly more green than the walls. The window curtains are double, the inner curtains are mauve, and the outer curtains are pale yellow. The furniture is tinted yellow, and the bedspreads are a warmer yellow. The object of having the furniture of the same colour as the walls is that it may not be obtrusive, but, as it were, fade into the walls. The fireplace is painted the colour of silver, and even the tea-sets are chosen of a pale yellowish tint. There is no pattern anywhere in the room, except that the upper edge of the bedspreads has a simple design, and over the fireplace a small painting hangs, representing a scene near Maidstone in early spring. Mr. Prosser maintains that it is essential that no browns or reds should be used, for these colours are saddening. There is no doubt that this ward has a very cheerful effect, and we can well believe that the eyes of a man greatly depressed from shell shock or from some other cause would find in such a room as this no little relief from his depression, and this merely from the general aspect of the room. Mr. Prosser has devoted much trouble to carrying out his ideas, and though we do not endorse them fully, we feel that there is something to be said in their favour; anyhow we agree that the colouring of wards for the sick and wounded has been too little considered in the design of many hospitals. The work of Mr. Prosser will not have been in vain if it leads to more care being devoted to this aspect of hospital furnishing.

PRIMARY TUBERCULOSIS OF THE TONSIL.

IN an investigation made by Dr. A. Philp Mitchell for the Medical Research Committee, and published in the *Journal of Pathology and Bacteriology* (vol. xxi.), the author concludes that tuberculosis of the upper deep cervical glands develops from a primary focus in the faucial tonsils much more often than commonly supposed. Primary tuberculosis of the tonsil cannot be recognised by the naked eye, but requires the aid of the microscope or of inoculation experiments. Lesions tend to appear in certain sites, commonly just subjacent to the surface epithelium near the mouth of the lacunæ, less often in relation to the deeper portions of crypts, or deep in the tonsil close to the capsule. 100 cases of cervical adenitis in children and 6 in adults were examined, and in 41 of them tuberculous lesions were demonstrated in the tonsil. With regard to the type of infection, the results indicate that in Scotland, at any rate, tonsillar tuberculosis is bovine in origin. In a small percentage of children Dr. Mitchell found both bovine and human types in the tonsillar crypts without demonstrable lesions either in the tonsils or elsewhere. He concludes that, on the curative side, tonsillectomy is essential in all cases of tuberculous cervical adenitis in children, and, on the preventive side, that the only immediate safeguard is the sterilisation of all cows' milk supplied to infants and children. The article contains a careful survey of previous work on the same subject, with an adequate bibliography. The author has succeeded in throwing fresh light on a very important problem.

THE SURGERY OF THE NOSE FROM AN ÆSTHETIC POINT OF VIEW.

THERE are few things of less real importance in itself than an ill-shaped nose; yet though such a nose serves olfactory purposes, if it be of a very unusual shape it may cause its possessor real anguish. All owners of an eccentric proboscis have not the qualities of Cyrano. When the sufferer seeks the aid of his own medical adviser he is usually told not to worry about a matter which is not of the least importance, and if the patient has the right temperament sounder advice cannot be given. But in other cases, where there is something definite that might be done, and where the patient's mental distress is very real, we think his complaint should be met in a different spirit. In a recent issue of THE LANCET we printed a paper by Dr. Julien Bourguet, of Toulouse, in which he described briefly the methods which he employs to remedy certain nasal

deformities, and he gives illustrations of some of the patients on whom he has operated, showing the original conditions and those left after operation. He thus proves how much may indeed be done by care and skill in many cases. Most of the results have been very good, for one important point in the method employed by Dr. Bourguet is that all the operative procedure is done from within the nose, the incisions being made through the mucous membrane, so that there is no external incision and no external scar. It is hardly necessary to say that in this country also there are surgeons who practise these cosmetic operations with success, and the numerous cases of nasal deformity which may be found among the wounded in the war offer a fine field for much good work, which should not be invariably closed by the suggestion to the patient that he had better put up with a trouble which does not affect his general health. Of course, a more difficult problem faces the surgeon who has to deal with cases where the nose is completely destroyed than where he has only to remedy an ugly shape. Here there can be no question of a slight operation; any operation that is done must be extensive and thorough, if the result is to be anything more than a travesty of a nose. The result cannot be called satisfactory unless it satisfies the patient, for the operation is only undertaken for the purpose of giving the sufferer relief from the annoyance of being without a nose. Since the days of Tagliacozzi the operation of rhinoplasty has had many exponents, and in favourable cases the results have been excellent, satisfying even the most exigeant of patients, while the operation devised and first practised in India may give results leaving little to be desired. There are, however, many cases of destroyed nose where the conditions of the tissue in the vicinity render thorough operation impossible. Some time ago[1] we published an illustrated account of nasal prosthetic feats. Lieutenant Derwent Wood, A.R.A., there showed, with the aid of some striking illustrations, the marvellous improvement which may be effected in the appearance of patients by the aid of masks of greater or less extent, according to the individual cases. Mr. Wood's knowledge as a sculptor enables him to imitate as perfectly as possible the former condition of the face, so that the patient may look as he looked before. The war has provided no small number of cases for the exercise of skill in these cases, and in many cases a marvellous alteration for the better can be accomplished.

IRITIS AND OPTIC NEURITIS FROM TONSILLITIS.

THAT tonsillitis may be the starting-point of many forms of systemic infection and of inflammation in other organs, such as endocarditis, pneumonia, meningitis, and nephritis, has been recognised in recent years. Though the relation between iritis and other forms of ocular inflammation and septic foci in other parts has been emphasised in the same period, the importance of the tonsil as a source of infection is not sufficiently recognised. In the *Boston Medical and Surgical Journal* Dr. I. Sobotky has reported a case of iritis and optic neuritis following tonsillitis in which tonsillectomy was curative, thus confirming the connexion. A woman, aged 21 years, convalescing from acute follicular tonsillitis, was seen on Oct. 19th, 1915. She showed enlarged and tender cervical glands and extreme congestion around the right cornea. She gave a history of attacks of tonsillitis, usually at yearly intervals and followed after a week by inflammation of the eyes. In the present attack the right eye was very painful and sensitive to light. She was sent to the Massachusetts Eye and Ear Infirmary, where the following record was made: "Oct. 20th: Iritis of right eye. Optic neuritis of both eyes. Pupil well dilated and regular. Upper lid slightly swollen. No evidence of syphilis. Oct. 25th: Less pain in right eye. Left eye, slight ciliary congestion. Oct. 29th: Nasal examination shows rhinitis and diseased tonsils. X ray report: Teeth and accessory sinuses negative." Dr. Quackenboos agreed with Dr. Sobotky that the tonsils should be removed. On Nov. 4th this was done. They showed chronic inflammation and the crypts were filled with caseous material. The Wassermann reaction was negative. On Dec. 14th both optic discs were swollen to at least two diopters with some dilatation of the vessels. On Jan. 11th, 1916, the swelling had diminished. On March 1st, but for slight blurring, the discs were normal. On Jan. 25th, 1917, the patient resumed work as a stenographer and has remained quite well since that date.

[1] THE LANCET, June 23rd, 1917.

NOTIFIED VENEREAL DISEASE IN CHRISTIANIA.

IN his annual report for 1916 on venereal disease, reprinted from *Tidsskrift for den Norske Laegeforening*, P. Schou, medical officer of health of Christiania, gives an account of the system of notification adopted in that city. Though the report contains much interesting statistical information, it omits many details which, to readers unacquainted with legislation on venereal disease in Norway, would have given a more comprehensive survey of the subject. 3240 new casse of venereal disease were notified, of which 1930 were gonorrhœa, 405 soft sore, 860 acquired syphilis, and 45 congenital syphilis. Of cases of extragenital infection there were 12 of primary syphilis of the lip, 8 of the tonsils, 1 of the abdomen, and 1 of the second finger of the right hand. In 70 cases the notifications contained information which led to investigation of the source of infection, and of these the search resulted in disclosure of the sources of infection in 43 cases. According to information received the medical officer of health and the assistant woman doctor examined 21 men and 25 women, of whom 1 man and 1 woman were "found" by the police. Five men and 4 women, instead of attending on the medical officer of health, let themselves be examined by other doctors and produced certificates; of these patients 3 men and 4 women proved to be infected. None refused to be examined. Of the notified patients, 140 men and 1 woman declared they had been infected outside the town, and of these a large proportion were sailors whose infection had occurred in foreign ports. The number of those infected outside the town was evidently greater; but some doctors did not specify the place of infection on notification. With the best of intentions the notifying doctors must probably often have found it impossible to provide this information. As regards marital infection, 22 women and 14 men notified their consorts as the source of infection. On account of intimate association with patients suffering from venereal disease (relations, adopted children, &c.) 6 men and 7 women were examined, with the result

that 1 woman was found suffering from syphilis and 1 from gonorrhœa. The report does not, however, state how the disease was contracted in these two cases. Further, 460 men and 138 women were examined by the medical officer of health and the assistant woman doctor after having voluntarily reported themselves to the medical officer of health in order to receive treatment or to be sent to hospital. Of the total number of patients examined, 28 men and 60 women were admitted to hospital. The Board of Health defrayed the expenses of special treatment for 209 men, of whom 69 suffered from syphilis. The woman doctor treated 49 women and 2 children at the Board of Health. Of these, 32 women and the 2 children suffered from syphilis. Certain cases of venereal disease which were given ambulatory treatment by the Board of Health were also given free medicine; this raised the cost during the year to kroner 3862, as compared with kroner 2782 in 1915. One notification dealt with a case of infection with syphilis after treatment with salvarsan. The medical officer of health approached the police 22 times with a view to securing their help for revealing sources of infection. One woman was admitted to hospital by the help of the police. The police notified 19 women and secured one conviction of offence against the law that any person who knows that he or she suffers from venereal disease and yet indulges in sexual intercourse or exposes another person to infection is liable to punishment up to three years' imprisonment. Dr. Schou does not state what penalty followed this isolated conviction, nor does he say why convictions were not secured in the other cases notified by the police. That they secured only one conviction out of 19 cases is, however, in itself an eloquent testimony to the difficulties encountered in legislative attempts to penalise the spread of venereal disease.

THE ORGANISM OF TYPHUS.

IN the third number of *The New East*, a monthly review of "thought and achievement in the Eastern and Western worlds," published in English and Japanese at Tokyo, appears a short summary by Professor Futaki and his colleagues of the present position of the search for the causal agent of typhus. Typhus was introduced into Japan from Russia in 1914, and the epidemic since occurring has afforded ample opportunity for etiological study. So far various competing agents have held the field: bacilli described by Ricketts and Wilder, intra-leucocytic bodies by Nicolle, both in 1910; a diplobacillus noted by Rabinowitsch and a diplococcus by Furth in 1912; other intra-corpuscular bodies seen by Prowazek, and recently cocci again by Plotz and his co-workers. After carefully examining these rival claims Futaki reported to the Japanese Congress of Internal Medicine in April, 1916, his inability to confirm any of them from his own observation, adding his conclusion that the virus was either a free, non-visible corpuscle or a minute spirochæte. After finishing an investigation into rat-bite fever with the isolation of a spirochæte the Japanese observers have now done the same for typhus. In April of this year a spirochæte was found in the lumen of a kidney tubule in a patient dead of typhus, and similar organisms in the next seven cases examined except one at a very late stage of the disease. Later spirochætes were found in the urine of patients in an early stage, and injections of blood from one such made into a *rhesus* monkey gave rise after nine days' incubation to an illness in which similar spirochætes were found in kidneys and urine. The organism is described as resembling in form the *S. pallida*, 6-8 μ in length, with 5-7 windings, and a short cilium at each extremity. It stains with silver and Giemsa. Dr. Futaki and his colleagues at the Imperial Institute for Infectious Diseases, Tokyo, believe the organism they describe to be the causal agent of typhus, and propose for it the name of *S. exanthematotyphi*. The name is correct but cumbrous in Western characters, and if the Japanese organism, as seems probable, retains its place, we might prefer to call it *S. japonica*.

ANNUAL REPORT OF THE CHIEF VETERINARY OFFICER FOR THE YEAR 1916.

THE report for 1916 of the Chief Veterinary Officer of the Board of Agriculture and Fisheries (published by H.M. Stationery Office) shows that the problem of combating the diseases of animals at home must not be neglected, even though the thoughts of everybody are concentrated on war and war areas. England, from its insular position, is especially fortunate in regard to its ability to prevent the entry of suspect animals from abroad, as it is enabled to enforce quarantine precautions; and for this reason there are some maladies which continental veterinary authorities are called in to deal with which do not exist with us. However, some of these contagious diseases still gain an entrance, and this in a manner at present not satisfactorily explained, but the necessity of careful attention to home matters as well as those outside the island of Great Britain itself is thus demonstrated. Foot-and-mouth disease of cattle is an instance of this, an outbreak of which occurred on Feb. 10th at a place as far away from a port of cattle debarkation as Shepton Mallet in Somerset. By the skill of the veterinary inspector it was diagnosed and reported, and the Board of Agriculture confirmed and dealt satisfactorily with it. Careful inquiries, however, failed to detect the origin of the outbreak. In the report the other scheduled diseases are dealt with, particularly swine fever, swine erysipelas, tuberculosis, glanders, anthrax, and sheep scab. 4331 outbreaks of swine fever were confirmed, an increase of 337 on the previous year. Serum treatment was accepted by the owners in 83 per cent. of suitable cases, the results showing a benefit of 17 per cent. in favour of pigs on premises where such treatment was applied. Serum treatment being preventive and not curative, successful results depend largely on getting early in touch with outbreaks. Greater finality is hoped from treatment with sero-vaccine, which is still on its trial, since the mortality from the treatment itself has been considerable. About 9000 specimens were examined and reported upon in the Veterinary Laboratory—altogether a busy year's work when many of the staff are away on active service.

AN exhibition of war specimens, collected by members of the Royal Army Medical Corps and prepared by members of the museum staff of the Royal College of Surgeons, will be opened in the museum of the College, Lincoln's Inn-fields, W.C., on Thursday, Oct. 11th, at 3 P.M., by Sir Alfred Keogh, G.C.B., Director-General of the Army Medical Service. At the same time the Council of the College will present its honorary Fellowship to Sir Alfred Keogh.

THE CONTROL OF VENEREAL DISEASES.

National Council for Combating Venereal Diseases.[1]

THE question of the artificial prophylaxis of venereal disease has been discussed at a recent conference of the National Council and at two meetings of its Executive Committee. A special meeting of the Council is to be held on Monday, Oct. 15th, at 8.30. P.M., at 1, Wimpole-street, W., to consider the following resolution submitted by the Executive Committee :—

In view of the public attention now directed to the whole subject of prophylaxis, the Executive Committee, after careful consideration, is not prepared to depart from its original position, in which, in accordance with the spirit of the Royal Commission's Report, it refrained from recommending the adoption of prophylaxis—i.e., the provision of outfits to men before sexual indulgence. The committee strongly urge the importance of the making of arrangements for the early treatment of venereal disease even before the outset of symptoms.

An informal discussion on the progress of the movement between members of the executive and other committees and the members of the National Council will take place at a reception to be held at the Grafton Galleries at 8.30 P.M. on Tuesday, Oct. 16th, when delegates from the various branches will be present.

Measures Taken in New South Wales.

Speaking at the recent annual general meeting of the Royal Prince Alfred Hospital at Sydney Sir Thomas A. Stuart, chairman of the board of directors, spoke of the work of the evening venereal clinics instituted in 1914 at the request of the State Government. Before the establishment of these clinics a large number of cases were not treated at all, or were treated by quacks. The Royal Prince Alfred Hospital was the only institution responding to the Government's appeal, with the result that patients came in crowds and overwhelmed the resources of the hospital. In 1915 more than 2000 cases were on the books during the year, while in 1916 the number was 2643. On one occasion it was necessary to call in the police to assist in maintaining order, and the board was reluctantly compelled to reduce the numbers admitted to the clinics. The hospital has 30 beds for women and children suffering from venereal diseases and has served as a model for the establishment of similar clinics in three other States and in New Zealand.

Sir Thomas Stuart referred to a report made to him by the medical superintendent of the hospital, who had just returned from Egypt, where he had been instrumental in carrying through certain preventive measures. A prophylactic or preventive tent was established at the entrance of each camp for men returning to their quarters after having exposed themselves to infection. Of a certain series of 2000 cases only three developed disease, while in another series in the first month after the system had been established, of 432 men who were attended to in the tent not one became infected, while of 35 men who developed the disease not one had visited the tent. Acting on this report the Commonwealth Defence Department has established similar arrangements at each military camp in the several States.

Enlightenment Campaign in Victoria.

The Public Health Department of the State of Victoria has issued a 16-page pamphlet dealing in popular manner with venereal diseases: (1) the causes, symptoms, and results of venereal diseases; (2) the provisions of the Venereal Diseases Act; (3) directions to parents and guardians regarding children suffering from venereal disease; and (4) the provisions relating to advertisements.

The provisions of the Venereal Diseases Act, 1916, may be briefly summarised as follows: 1. Any person suffering from a venereal disease shall forthwith, on becoming aware of his condition, consult a medical practitioner, either privately or at a hospital or clinic, and shall also supply his correct name and address. Failure to do so renders him reliable to a penalty of £20. It is illegal for any person other than a medical practitioner to treat venereal disease. Chemists are not allowed by law to treat any person suffering from venereal disease. 2. Every patient who is under medical treatment shall continue under treatment until he has received a certificate of cure. 3. A patient may change his medical attendant, but if he does so, must inform his new adviser of the name and address of his last adviser. 4. A person suffering from venereal disease, and not being treated by a medical practitioner, may be apprehended, after due warning, and detained until cured. 5. No one shall knowingly infect any other person with a venereal disease, or knowingly do or permit or suffer any act likely to lead to the infection of any other person with such a disease. Penalty, £100 or 12 months' imprisonment, or both. 6. No one suffering from venereal disease shall prepare or handle food intended for consumption. 7. Anyone suffering from venereal disease shall take all reasonable precautions to prevent spread of infection, and shall carry out the directions and instructions of the medical attendant.

The provisions relating to advertisement prohibit under penalty of fine or imprisonment anything in the nature of a public advertisement relating to venereal diseases, nervous debility, or to the treatment of complaints peculiar to women. The offender is liable to summary arrest. Any person printing or distributing such advertisement is also liable to severe penalty. And any newspaper or any printed or written matter is prohibited from entering Victoria if it contains reference in the nature of an advertisement to the conditions mentioned. A protective clause runs as follows: "No offence, however, will be committed by any person who prints, publishes, distributes, delivers, or posts any *bonâ-fide* medical or pharmaceutical book, pamphlet, magazine, or periodical, or any work of recognised literary merit relating to the conditions referred to."

Bombay League for Combating Venereal Diseases.

The Bombay Sanitary Association, which was founded in 1902 with a view of coöperating with the Health Department in educating the public on matters of hygiene and sanitation, held a conference on March 6th and 20th, 1917, to discuss the incidence and control of venereal diseases in Bombay, at which the following resolutions were passed :—

1. That in view of the great prevalence of venereal diseases in Bombay and of their grave consequences, this conference of medical men assembled is of opinion that the time has come when the public and the State should be roused to the gravity of the situation, and induced to take measures to prevent them.
2. That a league for combating venereal diseases, and consisting of medical and lay men, be formed to educate public opinion and to devise and assist in carrying out all such measures as are calculated to prevent the spread of these diseases.

A provisional committee was appointed to take the necessary steps for the formation of the League, with the Hon. Mr. G. S. Curtis, C.S.I., I.C.S., as president, Surgeon-General R. W. S. Lyons, M.D., I.M.S., and Sir Fazulbhoy Currimbhoy as vice-presidents, and Dr. John A. Turner, C.I.E., and Dr. Lemuel L. Joshi as joint honorary secretaries. At a later meeting of this committee the aims and objects of the League were defined as follows: (1) To provide accurate and enlightened information as to the prevalence of these diseases, and as to the necessity for early treatment; (2) to promote the provision of greater facilities for their treatment; (3) to increase the opportunities of medical students and practitioners for the study of these diseases; (4) to encourage and assist the dissemination of a sound knowledge of the physiological laws of life in order to raise the standard both of health and conduct; (5) to coöperate with existing associations, to seek their approval and support, and to give advice when desired; (6) to arrange, in connexion with such organisations, for courses of lectures, and to supervise the preparation of suitable literature; (7) to promote such legislative, social, and administrative reforms as are relevant to the foregoing aims and objects.

Dr. J. A. Turner read a paper at the conference summarising the work being done in England and suggesting measures of control in Bombay. The scheme he outlined involved an initial outlay on dispensary and clinic of R.5000 with an annual cost of R.20,000 for maintenance. Dr. A. Powell described the course of syphilis among the Indian community, summarising the distinctive characters as follows: Syphilis does not by any means run exactly the same course in Indians as it does in Europeans. Hence European practitioners fresh from European schools look out for—and miss—the signs common in Europe. They find but do not correctly interpret those common in the indigenous people of this country. 1. Sore throats are much less common in India. 2. Rashes are less common. In a country where prickly heat and ringworm abound, rashes are easily overlooked, especially by the patient. 3.

[1] The address of the National Council is now Avenue Chambers, Southampton-row, London, W.C. 1. Tel.: Museum 2432.

Tabes and G.P.I. are infinitely less common in India. 4. Obscure "rheumatic" pains in the joints, bones, and muscles are infinitely more common, more severe, and more persistent in Indians; in fact, they are often almost the only secondary and tertiary symptoms. Genuine "acute rheumatism," "rheumatic fever" with its cardiac complications, is very rare among Indians. 5. Disease of the arteries is much more common in India. It is especially common in the ascending arch of the aorta and in the coronary arteries. 6. Disease of the aortic valves is more common than disease of the mitral valves in India.

REPORT FOR 1916 OF THE COUNTY MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER OF LONDON.[1]

Dr. W. H. Hamer's fifth annual report in each of these capacities has just been issued. Not farther back than last November his report for the preceding year was noticed in these columns.[2] The appearance of the present volume after this brief interval indicates commendable promptitude. Readers of the last two reports will miss the instructive series of diagrams which illustrate the volume for 1914. That their actual publication has been discontinued since that year is due to economic considerations. But from the present context it is evident that their compilation is still in progress, and we may therefore hope that on the return of peace conditions this impressive method of graphic representation will be resumed in the published reports.

PART I.—PUBLIC HEALTH.

The health of London in 1916 compares favourably with that of the preceding year. The medical officer warns us, however, that the estimates of population available are still less trustworthy than were those of 1915, a fact that must be remembered in comparing the statistics of successive years. When the National Register was compiled two years ago the marked local changes caused by war were only then beginning. Consequently that register, which had never been quite reliable, could not be regarded as even approximately forecasting the subsequent movements of population. The weather conditions of last year were phenomenal, and doubtless accounted in some measure for the substantial saving of life among infants, as well as for the unusual freedom at other ages from the ravages of infectious diseases. In the year 1916 the flow of water under London Bridge was greater than in any previous year on record. The floods of the early part of 1915 had been the highest since 1894, and there followed in the year under review a flow of water in the Thames of 875 thousand million gallons. Apart from abnormal weather conditions, the study of sickness and death-rates is complicated by disturbances incidental to war.

Vital Statistics.

The marriages in London during 1916 were fewer by about one-third than those of the previous year, the decrease being greatest in the second half of the year. The abnormally high number of marriages during the progress of hostilities probably corresponds fairly with the movements of enlistment. Difficulties arise in calculating a marriage rate for comparison with pre-war figures, owing to the circumstance that the data include men on active service, while the published estimate of population relates to civilians only. The Registrar-General calculates a rate of 19 per 1000 for 1916. In the previous year it probably amounted to about 26. For analogous reasons the computation of a reliable birth-rate is beset with difficulty. The birth-rate of the year under notice is officially estimated at 21·5 per 1000, against 22·5 in 1915; these rates may be generally compared with the average in the quinquennium before the war—viz., 25 per 1000.

Effect of war conditions on mortality.—The Registrar-General calculates the death-rate of 1916 at 14·7 per 1000 of the civil population. The rate of 1914 had been 14·6, calculated on the total population in the middle of the year. Thus, with fewer deaths in 1916 the mortality is stated to have been higher. This, however, is an anomaly depending solely on the use of a civil population, without correction for changes among the living resulting from the withdrawal of males of military age—a period of relatively low mortality. In the absence of hostilities the death-rate of last year would have been below that of 1914, and probably would have barely exceeded 13·6, the low rate of 1912. At most ages the mortality in 1916 shows a decided improvement upon that of 1914. The decrease in the deaths under one year is partly due to the still falling birth-rate, but not more than 10 per cent. thereof can be thus accounted for. The rate of infant mortality last year was 89 per 1000 births, and was 2 per 1000 above the lowest rate hitherto experienced in London. The favourable condition of moderate summer temperature has doubtless contributed to this result, but it is probable that the recent restrictions on the sale of intoxicants has had a large share in reducing the deaths from suffocation, and perhaps also from prematurity. It is worthy of mention that the decline in mortality has not taken place among infants *pari passu* with the decline at the higher ages; on the contrary, it has only become conspicuous during the current century, and particularly within the last seven years.

Infectious diseases.—The behaviour of infectious sickness last year was essentially similar to that in 1915. London suffered no disaster from the spread of typhus fever, and in spite of the importation of a few cases of small-pox that disease never obtained a foothold. The civilian notified cases of scarlet fever numbered 8746, or about half the total reported in the preceding year, and about one-third the total in 1914. There were fewer attacks in 1916 than in any year since 1891, when notification first became compulsory. The cases of diphtheria notified among civilians numbered 8743, differing little from the totals in each of the two preceding years. Enteric or typhoid fever still continues to decline. The notified attacks in 1914 had numbered 789, and in the following year 607, whilst there were only 461 in the year under review. Among many possible sources of infection fish or shell-fish were inculpated in 85 instances. The year 1916 was the fifth in succession in which there was marked smoothing out of the autumnal rise in London. The experience of last year confirms that of 1915 respecting the complete failure of evidence of increased spread of infection by human agency. For, after making due allowance for the absence abroad of susceptible persons, the prevalence of typhoid in London in the last two years has been actually lower than ever before known, despite the addition to the community of an appreciable number of typhoid convalescents from abroad. On the other hand, recent phenomena tally well with the theory of food causation. It is noteworthy that, as the late Dr. H. T. Bulstrode asserted in his reports of 1896 and 1911, a steady improvement has been brought about in the last 20 years by the elimination of dangerous shell-fish. As regards further reduction of typhoid fever, there is reason to believe that more benefit is likely to result from pursuing the older epidemiological methods than from giving effect to the new principles advocated by Koch and his followers. In particular, further care for the purity of shell-fish layings and entire prohibition of the sale of ungutted flat fish are to be looked upon as the main lines upon which further advance can be made.

Phthisis.—The civilian deaths from phthisis in the year 1916 numbered 6491, as compared with 6875 in 1915 and 6476 in 1914. At military ages there was a decrease last year on the deaths registered in 1914. The calculation of a mortality rate for the civil population from the above figures would give a result in no respect comparable with pre-war rates; for not only has the war left on the civil population practically all the pronounced phthisis, but a portion of the fatal cases among persons accepted for service, and among those subsequently discharged for tuberculous disease, are recorded as civilian deaths.

Cerebro-spinal fever.—In the course of last year 425 cases of this disease were notified among the civil residents of London, or fewer by 202 than in 1915. These figures do not include posterior basal meningitis. The Registrar-General tells us that in London cases of the last-named disease are notifiable under the head of cerebro-spinal fever, whilst elsewhere there is no uniformity of classification. In view

[1] King and Son, Westminster, pp. 42. Price 1s.
[2] THE LANCET, Nov. 11th, 1916, p. 837, and Nov. 25th, 1916, p. 913.

of this and other difficulties computation of fatality rates has not been attempted, it being evident that records of death from cerebro-spinal fever for London bears no consistent relation either to the notified cases of that disease or to the actual number of deaths from this cause.

Poliomyelitis.—There was an increase last year in the attacks by this disease reported throughout the country generally. In London 197 cases of poliomyelitis were notified, the highest number previously reported having been 145 in the year 1913.

PART II.—EDUCATION.

A large share of the energy of the County Council's medical staff continues to be devoted to matters connected with education. Of the administrative difficulties encountered in the preceding year as the result of war conditions no abatement was experienced in 1916. Thanks to the special efforts made by the older men and by the women already employed as school doctors, the work of medical inspection has been prosecuted with considerable success. Moreover, the difficulty of securing the services of a sufficiency of qualified persons for the hospital treatment of school children has been satisfactorily met. The further difficulty of retaining an adequate supply of nurses has been overcome by the Council, who have adopted financial measures against the further depletion of the nursing staff, whose full efficiency is essential in this department of the public service. The work of "following up" has been rendered particularly onerous by reason of the serious defection of volunteers. To meet this emergency the care committees of several adjacent schools have coöperated with the view of economising the work of home visitation, and thus carrying out the duty of following up in urgent cases albeit with a reduced number of visitors.

Medical inspection and treatment.—Of the children primarily examined by the doctors last year in elementary schools 88,415, or nearly one-third, were found to require treatment for defects. Reinspections were made of the children who at the first examination had been found ailing, with the result that 41·7 per cent. had been brought under treatment within six months, as compared with 49·6 per cent. in 1914. Between the authorities of maternity centres and the school medical service satisfactory cöoperation has been established. In two instances the premises of the school treatment centres are also used by the maternity centre for the treatment of mothers and of children under school age. Similar cöoperative schemes are in prospect at four other centres. The open-air schools at Birley House and Shooter's Hill were kept open throughout the year. Kensall House school for tuberculous children has also been continued, and some of the playground classes have been held in the public parks. Altogether 5422 children were examined during the year with a view of admission to special schools, and of these rather more than half were certified as suitable for admission. The remainder were either returned to elementary schools or were declared unsuitable for any of the Council's institutions.

Personal hygiene.—There are now 24 cleansing stations in London, at 20 of which scabies is admitted for treatment; more than 3000 children suffering from scabies were given not fewer than 17,000 baths in the course of the year. Examination was made of 988,000 children, 25,000 of whom were found to be verminous. Of these, 13,000 were were cleansed by the authorities and 11,000 by the parents. Verminous children attending schools in outlying districts are now brought under the scheme, and are conveyed to the cleansing stations in ambulances. Moreover, in certain instances borough councils are now giving special facilities for hot baths to be obtained by school children and members of their families.

Nutrition and malnutrition.—At the present time children suffering from that degree of malnutrition which is known as "wasting" are rare in our schools. Conditions leading to emaciation are now detected at an early stage, the sufferers being promptly referred to appropriate agencies for relief. In the course of last year only 0·4 per cent. of the children inspected were placed in this class, against 0·51 in 1915. From figures relating to the last four years it appears that the general state of the children has been better during the war than in the period immediately preceding. The steady improvement of previous years in clothing and footgear, as well as in general cleanliness, has been fully maintained during 1916. This fact is presumably attributable in some measure to better economic conditions, but it is doubtless largely due to the maintenance of medical and cleansing work carried on for some years past in connexion with the schools. The continued improvement of the children which is revealed at the medical inspections testifies to the success of the arduous work of the school nurses. "These splendid results," writes Dr. Hamer, "which show that none of the horrors of war have been allowed to affect the general condition of the children, or to interfere with the growth of that solicitous care for their welfare which has distinguished recent years, are a matter for profound joy and satisfaction. They may well encourage us to face the future with complete confidence; for a community that can thus protect its children while putting forth the most prodigious martial efforts the world has ever seen, must be sound to the core." The dominant influence of social condition is manifest in the returns of the various parts of the metropolis. A map showing the nutritional state of the children would correspond generally to one showing their social condition. That this is so is abundantly evident from the report. In the year 1913 a special study was made of the health of children of school age. In a report respecting nearly 1000 of these children the close connexion of tuberculous disease with malnutrition was emphasised, tuberculosis being definitely recognised in 19 per cent. of the cases examined, and its presence being suspected in a large additional proportion.

Infectious diseases.—The year under review was remarkable for exceptional freedom from infectious disease among school children. In the case of scarlet fever the returns are particularly satisfactory. In certain weeks of August and December the scarlet fever notifications throughout the metropolis were fewer than 100, being only about one-third the average in the corresponding weeks of the previous four years. As causes producing this result the effect of altered nomenclature, of climatic influence, and of flea prevalence are here reviewed, and the important question of the relationship of scarlet fever is considered. As regards flea prevalence, we note that examination of the flea and scarlet fever curves in the last eight years reveals a striking correspondence in their annual variations. Among measures for limiting the spread of scarlet fever the importance of hospital isolation is taken for granted, and the fact is referred to that the low level reached by that disease in 1916 has fortunately liberated for other uses many additional beds in the hospitals of the Metropolitan Asylums Board. In respect of epidemic throat illness the record of the year under notice was unique, inasmuch as the notifications of diphtheria actually exceeded those of scarlet fever for the whole year, whilst from September onwards the excess was marked. The strange comment was made in some quarters that the position was a serious one, inasmuch as diphtheria was more widely prevalent in London than scarlet fever, the real explanation being, of course, that the figures for scarlet fever were so exceptionally low as to render those for diphtheria unsatisfactory by contrast. As long ago as the eighteenth century much confusion prevailed with reference to epidemic throat disease. It was not until 1831 that the term "diphtheria" was employed; up to 1855 the two diseases in question were classed together by the Registrar-General, and in German statistical returns the heading "Scharlach diphtherie" has continued in use till now. The discovery of the diphtheria bacillus by Klebs and Loeffler in 1883 and 1884 led to the adoption of bacteriological methods for confirmation of the diagnosis of diphtheria, and probably as a result there has been an increasing use of that term during the last 30 years. The relationship between dry years and one or both of these conditions has been exhaustively analysed by Dr. J. B. Longstaff and Sir Arthur Newsholme. Dr. Longstaff found the correspondence close in the "sixties" and early "seventies," but less marked in later years. Whilst Sir Arthur Newsholme, dealing with diphtheria alone, concludes that the essential factor in the production of epidemic, and still more of pandemic, diphtheria is the occurrence of a succession of years of deficient rainfall, associated as they must be with abnormally dry conditions of the soil and subsoil.

DONATIONS AND BEQUESTS.—The committee who are distributing the residuary estate of the late Mr. Leopold Salomons have allocated a further £50,000 to hospitals.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Importation of Malaria into France.

I HAVE several times mentioned the existing fear that subjects of malaria, who are returning to France in great numbers from the Salonika Forces, should prove sources whence malarial disease may develop in their native country. Against this apprehension it has always been urged that the intervention of particular kinds of anopheles is required, and that the culices and anopheles met with in France are inoffensive. For prudence sake, however, it has been recommended that hospitals reserved for the subjects of malaria should be placed in localities where there is not much stagnant water or many breeding places for gnats. Definite proof now comes that fears on the subject were not exaggerated and that the hæmatozoa of oriental malaria can be transmitted by our indigenous anopheles, which seem to be capable of this new and regrettable adaptation. M. Victor Raymond and M. Grysez proved the possible occurrence last spring of cases of malaria among soldiers coming direct from regions in France where the disease is unknown, but who had occupied trenches where the soldiers preceding them had returned from Salonika, having contracted malaria; the *terrain* was flooded and mosquitoes abounded there, among them several kinds of anopheles. A confirmation of the possibility of outbursts of malaria, derived from the East, and one having great weight, has now been furnished by M. Laveran, who has presented to the Académie des Sciences a research carried out at the Pasteur Institute by M. Rouband. M. Rouband has submitted to bites from indigenous anopheles malarious subjects who have returned from Salonika with the disease upon them. He has found in the proboscis of these anopheles living hæmatozoa, and having submitted himself to bites succeeded in contracting malaria of a characteristic form, with periodic febrile accessions and the presence of hæmatozoa in his blood. M. Laveran concludes from this that it is necessary to keep the victims of malaria away from regions where the mosquito abounds, and to instal on elevated plateaux, where the nights are cold, hospitals reserved for them, the beds being furnished with nets. Otherwise there is, he says, a risk that after the war malaria may invade France and render it, or at any rate our warmer regions, as unhealthy as the oriental plains.

Breastplates for Soldiers.

Inspector-General Delorme has called the attention of the Académie de Médecine to the frequency and immediate gravity of penetrating wounds of the thorax and abdomen. These represent an enormous proportion of deaths on the field of battle, while the adoption of steel helmets has considerably diminished the total of grave wounds of the skull. Wounds of the heart, big vessels, lungs, and abdominal viscera account for the chief part of the mortality among those of the wounded who die before there is time to render them proper care. These wounds in a trench war are due, not for the most part to rifles or machine guns, against which there is no possible protection, but to the bursting of explosive projectiles, hand grenades or shrapnel, all of which inflict wounds with a relatively feeble initial velocity, so that a method of protection, which would be powerless against bullets, would meet the case. In view of the excellent results given in head wounds against the same sort of projectiles by the steel helmet now used by all the soldiers, M. Delorme proposes that the troops should be provided with a breast-plate of the same metal and thickness, suspended round the neck and covering entirely the front of the trunk from the root of the neck to the pubis, the weight not being greater than that of the helmet; this breast-plate could be placed over the back when kneeling in the trenches or when lying flat on the stomach. The Académie de Médecine has unanimously decided to invite the Minister of War to submit the idea to practical experiment.

The Disappearance of Small-pox from Paris.

At the last meeting of the Seine Board of Health Dr. Roux, of the Pasteur Institute, reported on the results of small-pox vaccination in Paris during 1916. The 800,000 vaccinations performed in Paris at the outbreak of the war and during the year 1915 resulted in the disappearance of small-pox from the city, and in spite of the fluctuation in population due to mobilisation, and of the fact that Paris had given shelter to a number of refugees from the invaded districts, the capital remained immune from small-pox. This had occurred although all the conditions favourable to the breeding of the disease were notably present, among immigrants both morally and physically reduced, of whom the greater number had not been revaccinated and some not vaccinated at all. Small-pox infection was repeatedly introduced from outside sources without spreading in the city. Dr. Roux considers that a prolonged war without small-pox is a remarkable fact, proving the efficacy of the prophylactic measures taken. The honour of the achievement is due to the vaccination service as well as to the public, which has eagerly responded to the appeals addressed to it by the Government in placards and newspaper advertisements. During the year 1916 only a single case of small-pox was notified in Paris, and one case was imported from Algiers. The latter was an Arab who had not been vaccinated in infancy, and who arrived in Paris during the period of incubation; he was admitted to the hospital Claude-Bernard, where he died. This Arab worked in a factory where 1000 men were employed, living with his brother. The workmen and the brother were vaccinated on the day the disease was recognised and not one of them contracted it.

Antirabic Inoculation at the Pasteur Institute in 1916.

During the year 1916 1391 persons underwent preventive inoculation at the Pasteur Institute in Paris; six died of hydrophobia, giving a gross percentage of 0·43. But two of the patients developed the disease while still under treatment, and one died less than a fortnight after its conclusion. Deducting these three, the revised statistics stand: Persons treated, 1388; deaths from hydrophobia, 3; mortality, 0·21 per cent.

Improved War Bread.

The war bread used in France, made from 85 per cent. flour, has given rise to much complaint. The grey-black colour and unpleasant taste have disgusted a number of consumers, with the result that a large amount has been wasted, and the question has arisen whether economy would not be better served by providing bread made with normal flour and limiting its consumption by a special bread-card. It is not disputed that the present bread keeps badly and quickly undergoes acid fermentation, leading to gastric and intestinal disorders in persons predisposed to dyspepsia. The researches undertaken by MM. Lapicque and Legendre at the Ministry of Inventions have now made it possible to grind the flour to the 85 per cent. standard and still avoid the greater part of the objectionable qualities. They have shown that the constituent of war flour eliminated from 70 per cent. (white), known by millers as *recoupettes*, is the part which deteriorates by fermentation and gives rise to acid products. By alkalising the flour when it is mixed this injurious fermentation is held in check. M. Lapicque bases his conclusions on a simple experiment which can be readily confirmed. A piece of slaked lime wrapped in a piece of cloth and held by a string is placed in the bowl from which the baker takes his water for making the dough. The quantity of lime which dissolves under these conditions is 1 : 1000, and exactly the proportion required for checking fermentation; it is therefore only necessary to see that the lime is renewed when exhausted. The manufacture involves practically no extra trouble to the baker, while the increase in cost is trifling, less than 5 cts. for 3000 kilos., 1 gramme of lime being sufficient for 3 kilos. of bread. The quantity of hydrated lime introduced into the daily diet of the consumer does not exceed 10-20 centigrammes, of which the greater part becomes carbonate during the leavening. This amount is harmless, being indeed not greater than that contained in a glass of milk. The new war-bread is much superior to the old; the dough is well risen, whiter, and not viscous; the smell is pleasant and not acid; the crust is excellent. The bread keeps well and its digestion does not lead to any disorder. The public has been quick to appreciate these advantages, and bakers who have begun to make the bread according to official instructions based on a communication by Dr. Lapicque to the Academies of Medicine and Sciences have soon been obliged to increase their bakings. It is a curious fact that even animals have noticed the difference between this bread and the other, and having once tasted the new refuse the old.

Joy-riding for Whooping-cough.

It has long been known that convalescence after whooping-cough is accelerated by change of air, by movement from one locality to another, whether from town to country, or from one part to another of the same country. From these observations Dr. Challamel claims to have deduced an original therapeutic method. He assumes that intense oxygenation of the lung is the cause of improvement, and therefore utilises the effects of motor driving in the fresh air. Under the influence of rapid transit through the air intrapulmonary pressure is probably augmented, with increased ventilation of the air cells. The effect is, in fact, the same as in the compressed-air chamber, but the joy-ride affords a practical method within the reach of all. The author has brought to the notice of the Therapeutical Society several cures effected by this treatment, which he has begun to practise at early stages of the disease, as soon as the temperature has fallen. A beginning is made with a ride of ½–1 hour at a slow speed, in an open motor, the child's face being protected from dust; little by little the length and speed of the ride are increased. The treatment can be carried out in all kinds of weather except actual rain; the presence of bright sunlight is not essential. Cures have resulted after two rides, and as a rule a few prove sufficient. The only contra-indications are fever and extreme youth. The treatment should not be employed for children under the age of three months.

Obituary.

DAVID CHARLES REES, M.R.C.S. ENG., L.R.C.P. LOND.

Mr. D. C. Rees, whose death from typhus fever in Port Elizabeth, South Africa, was recently announced in the *Medical Journal of South Africa*, was educated at Charing Cross Hospital Medical School, and after obtaining the Diploma of the Conjoint Board went out to Nigeria with General Lugard's Frontier Force. He went up the Niger, saw service there, and gained considerable experience in the diseases of the country. On his return the London School of Tropical Medicine was just being opened, and Sir Patrick Manson immediately secured his services as the superintendent, or, as it was then called, medical tutor of the school. The first session opened on Oct. 1st, 1899, and Mr. Rees was responsible for organising the lectures and other details of the course. So well did he do this that the general scheme adopted by him has held till the present day. He was himself an able teacher, and had a happy knack of interesting the early students in the laboratory work, most of which was usually quite new to them. In the summer of 1901, during the vacation, he visited the experimental house, set up by the School in the Roman Campagna for malarial experiments, and he stayed there for several days with Dr. L. Sambon and Dr. G. C. Low, the experimenters. He then returned to the school for the fourth session, and worked in London till the end of the year, finally, to the sorrow of all his fellow teachers, giving up his appointment to take up the very important one of district surgeon and port health officer at Port Elizabeth. Here the opportunity of combating plague and small-pox presented itself, and, ably dealing with these, Mr. Rees made a name for himself in this line; that he should have died from typhus, the disease he was trying to stamp out at the moment, is very sad. After taking up his residence in South Africa he did not have the time or opportunity to come much to London, but he visited the capital on the occasion of his marriage and again three or four years ago, when he renewed his old associations with the School of Tropical Medicine.

There is little doubt, if Mr. Rees had stuck to tropical medicine, that he would have become famous in that section of medicine. Before leaving for Africa he wrote on tropical subjects to the journals, and these contributions were always well written and carefully thought out; but work in Port Elizabeth did not allow him to keep up his literary activity. At the time of his death Mr. Rees was in his fiftieth year, and he has left a widow and two children to mourn their loss. To them we offer sincere sympathy, and the London School of Tropical Medicine and all its teachers who knew and were associated with the deceased will offer them the same.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue:—

Killed.

Capt. B. A. Bull, R.A.M.C., attached London Regiment, was educated at Oxford and at St. Bartholomew's Hospital, London, and qualified in 1915. Shortly afterwards he joined up.

Died of Wounds.

Capt. F. Hardie, R.A.M.C., qualified at Edinburgh in 1900, and was in practice at Southampton prior to joining up.

Died.

Lieut. D. Anderson, R.A.M.C.

Wounded.

Capt. A. C. Ransford, R.A.M.C.
Capt. R. G. Abercrombie, R.A.M.C.
Capt. G. A. Macfarlane, R.A.M.C.
Lieut. C. B. Simpson, R.A.M.C.
Capt. D. L. Tate, R.A.M.C.
Capt. F. G. Flood, R.A.M.C.
Capt. F. A. L'Estrange, R.A.M.C., attached Rifle Brigade.
Capt. M. McNiff, R.A.M.C., attached Durham Light Infantry.
Lieut. G. H. Adam, R.A.M.C., attached Lancs Fusiliers.
Capt. F. Black, R.A.M.C., attached Royal Engineers.
Lieut. C. O. Bodman, R.A.M.C.
Lieut.-Col. G. H. L. Hammerton, M.C., R.A.M.C.
Lieut. J. C. Pearce, R.A.M.C., attached Yorks Light Infantry.
Capt. D. O. Riddel, D.S.O., R.A.M.C., attached W. Yorks Regiment.
Capt. W. Turner, R.A.M.C.

Slightly Injured.

Surgeon A. E. Panter, R.N.

CASUALTIES AMONG THE SONS OF MEDICAL MEN.

The following additional casualties among the sons of medical men are reported:—

Second Lieut. J. B. Bailey, East Yorks Regiment, killed in action, only child of Dr. J. E. Bailey, of Beverley, Yorkshire.

Second Lieut. F. J. Chown, Royal Flying Corps, killed in action, only son of Dr. F. Chown, of Townshend, near Hayle, Cornwall.

Capt. R. A. Eakin, King's Shropshire Light Infantry, died of wounds, only son of Dr. J. W. Eakin, of South Mimms, Barnet, and late of Trinidad.

C. M. Richards, killed in action, only son of Dr. M. Richards, of Fremantle Western Australia.

Second Lieut. G. D. Rose, Gordon Highlanders, killed in action, second son of Dr. G. Rose, of Aberdeen.

Second Lieut. E. C. G. Hull, Royal Field Artillery, killed in action, elder son of Dr. E. G. Hull, of Streatham Common, London.

Flight Sub-Lieut. N. S. Wright, R.N., killed, son of Dr. W. S. Wright, of Wool, Dorset.

FOREIGN DECORATIONS.

French.

Croix de Guerre.—Major (temporary Lieut.-Col.) L. J. M. Deas, I.M.S.; Temp. Capt. A. L. George, R.A.M.C.

THE HONOURS LIST.

The following awards to medical officers are announced. The acts of gallantry for which the awards were made are not yet announced. All are members of the R.A.M.C. unless otherwise stated. The dates in parentheses, in those cases where bars have been awarded, refer to the number of THE LANCET in which a record of the original decoration will be found:—

Bar to the Distinguished Service Order.—Maj. J. S. Y. Rogers, D.S.O. (Jan. 22nd, 1916, p. 215).

Distinguished Service Order.—Capt. (acting Lt.-Col.) J. D. Bowie; Temp. Capt. D. Lees; Temp. Capt. I. C. Maclean, M.C.; Maj. (temp. Lt.-Col.) E. C. Montgomery-Smith; Temp. Capt. H. A. Pallant, M.C.; Temp. Capt. J. B. Orr, M.C.; Capt. G. D. Watkins.

Bar to the Military Cross.—Capt. W. B. Allen, V.C., M.C. (Sept. 30th, 1916, p. 620); Temp. Lt. (temp. Capt.) L. G. Bourdillon, D.S.O., M.C. (Jan. 22nd, 1916, p. 215); Temp. Capt. R. I. Harris, M.C. (Nov. 18th, 1916, p. 881); Capt. W. McFarlane, M.C. (Dec. 16th, 1916, p. 1034); Capt. H. R. Partridge, M.C. (Oct. 28th, 1916, p. 770); Capt. J. D. Proud, M.C., Spec. Res. (June 23rd, 1917, p. 969).

Military Cross.—Temp. Capt. G. M. Adam; Capt. C. D. S. Agassiz; Capt. A. C. Bateman, Spec. Res.; Temp. Capt. S. J. A. Beale; Capt. K.

Biggs, Spec. Res.; Temp. Capt. G. A. Bird; Capt. R. G. Blair, Spec. Res.; Capt. F. D. Blandy; Temp. Capt. C. A. Brisco; Temp. Capt. W. T. Brown; Temp. Capt. W. T. C. Pearce; Temp. Capt. F. B Chavasse; Temp. Capt. V. L. Connolly; Capt. T. F. Corkill, Spec. Res.; Temp. Capt. G. T. Cregan; Temp. Capt. D. St. C. Creighton; Temp. Capt. E. P. Dark; Temp. Capt. H. B. Day; Temp. Capt. J. W. Dorling; Capt. W. E. FitzGerald; Temp. Capt. R. S. Gibson; Capt. J. C. G. Glassford, Australian A.M.C.; Capt. H. M. Goldstein, New Zealand M.C.; Temp. Capt. J. C. B. Grant; Temp. Capt. N. Grellier; Temp. Capt. F. Harris; Temp. Capt. H. H. Hepburn; Temp. Capt. J. Hill; Temp. Lt. R. G. Hill; Temp. Lt. W. J. Isbister; Temp. Lt. R. S. Kennedy; Temp. Capt. A. F. Laird; Temp. Capt. G. E. Lindsay; Temp. Capt. C. R. MacLeod; Temp. Capt. D. McVicker; Temp. Capt. J. I. O'Sullivan; Temp. Capt. W. H. Parry; Capt. J. A. Paterson; Temp. Capt. F. T. Rees; Temp. Capt. D. S. Robertson; Capt. G. W. Rogers; Temp. Lt. J. P. Ryan, Capt. J. E. Rusby, Spec. Res.; Temp. Capt. A. H. D. Smith; Temp. Capt. J. A. Smith; Capt. H. M. Spoor; Capt. R. A. Stark; Capt. J. Stephenson, Spec. Res.; Capt. W. H. E. Stewart; Temp. Capt. T. J. L. Thompson; Temp. Capt. E. A. Walker; Temp. Lt. T. C. D. Watt; Temp. Capt. H. F. Wilson.

OBITUARY OF THE WAR.

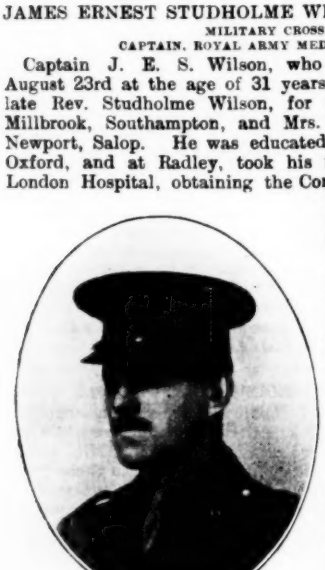
WILLIAM DUNCAN KIRKLAND, M.B., CH.M. SYD.,
MILITARY CROSS,
MAJOR, AUSTRALIAN ARMY MEDICAL CORPS.

Major W. D. Kirkland, who was recently killed on active service at the age of 26 years, was elder son of the late Lieutenant-Colonel Hugh Kirkland, M.B., Ch.M. Glasg., A.A.M.C. Born at Bathurst, N.S.W., he was educated at Coerwell Academy, Bowenfells, matriculating in 1908. Entering St. Andrew's College, Sydney, he graduated in medicine, with honours, in March, 1913, and became resident medical officer at the Royal Prince Alfred Hospital and later radiographer. After a brief but successful period of private practice at Lithgow, N.S.W., he enlisted in the Australian Imperial Force in May, 1916, and went to France in November. He had already held a commission in the Scottish Rifles, C.M.F., and was soon transferred to the Australian Army Medical Corps. He won the Military Cross by attention to wounded close to an ammunition dump in which shells were constantly exploding, and by his disregard of personal danger was instrumental in saving many lives.

Major Kirkland was a keen sportsman at school and college, which he represented in athletics. His friends feel the loss of one who was universally recognised as a pleasant companion and a capable and conscientious officer. He was unmarried.

JAMES ERNEST STUDHOLME WILSON, M.R.C.S. ENG.,
MILITARY CROSS,
CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain J. E. S. Wilson, who died of wounds on August 23rd at the age of 31 years, was elder son of the late Rev. Studholme Wilson, for many years rector of Millbrook, Southampton, and Mrs. Wilson, of Stoneleigh, Newport, Salop. He was educated at Summerfields, near Oxford, and at Radley, took his medical course at the London Hospital, obtaining the Conjoint qualifications in 1911, and starting at once in general practice at Iver, Bucks.



In December, 1915, he obtained a commission in the Royal Army Medical Corps, attached to a Bucks regiment, and left with his battalion in the following May. Two months later he was awarded the Military Cross "for conspicuous gallantry and devotion to duty during operations," after having gone through a very heavy barrage to assist the wounded. His colonel writes of Captain Wilson's courage: "He was himself hit early in the evening, but insisted on going on with his work for six hours. His name," he adds, "will be a lasting and inspiring memory to the officers and men of his battalion."

Captain Wilson married, in 1912, Marjory, daughter of the late Thomas Ireland, of Mossley Hill, Liverpool, who survives him with an only child.

RONALD LENNOX HENDERSON, M.B., CH.B. EDIN.,
MILITARY CROSS,
CAPTAIN, AUSTRALIAN ARMY MEDICAL CORPS.

Captain R. L. Henderson, who died of wounds received in action at Bullecourt in May this year, graduated at Edinburgh University in 1903 before emigrating to New South Wales, where he practised for several years at Lismore. In July, 1915, he joined the Australian Army Medical Corps and was sent to Egypt, afterwards being attached for several months to No. 2 Stationary Hospital at Lemnos. When the Australian troops left for France he went with them and remained, except for a few months' illness, until the time of his fatal injury. He was hit in the leg in June, 1916, but refused to be evacuated, and tended the wounded of his unit with no thought of personal safety. A few days before being wounded himself he was awarded the Military Cross. His superior officer writes of him: "Always a splendid companion in times of stress, his kindly humour and steadfast devotion to duty made him a favourite with his fellow officers and his men. We have lost in him a man of exceptional courage and high character."

ANTHONY TRAILL, M.B., CH.B. OXON.,
CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain A. Traill, who died at a casualty clearing station in France on August 25th, after a few days' illness, was 27 years of age and second son of Edmund B. Traill, of Pebmarsh, Essex, and Chirú, Traill, Argentina. He was born near Dublin, and educated at Charterhouse and New College, Oxford. While at Oxford he became president of the O.U.L.T.C. and won the challenge cup. From Oxford he went to Guy's Hospital, obtaining his medical degrees in 1915. In February, 1916, he received a commission in the Royal Army Medical Corps, and went to the front in the early part of this year. While still at Oxford he had a severe attack of hæmorrhage from a duodenal ulcer, and it was a recurrence of this trouble while attached to a regiment which was the cause of his untimely death. A promising career has been thus cut short.

EDMUND FITZGERALD BANNATYNE WILSON, M.D. DUB.,
MAJOR, SOUTH AFRICAN MEDICAL CORPS.

Major E. F. B. Wilson, who died as the result of an accident on August 17th, was educated at Trinity College, Dublin, taking the M.B., B.Ch. in 1881 and the M.D. in 1890. After practising for a few years in Ireland he went to South Africa, settling in Harrismith, Orange Free State. At the outbreak of the Boer War he was still in practice in this town, but managed to escape, and eventually was given a commission as a combatant in one of the Irregular Corps which were formed. This he held for a short time, when the need for doctors becoming acute he was utilised as a medical officer. He received the Queen's and King's medals for the campaign, and after the war returned to Harrismith, when he was appointed district surgeon and railway medical officer under the British régime. In this capacity he did much useful work, and was greatly esteemed in the town and district.

At the outbreak of the present world-war Major Wilson joined up for service with the Union Forces, and after suppression of the rebellion he was sent to German South-West Africa. At the conclusion of the campaign he joined the South African Overseas Expeditionary Force with the rank of major in the 1st South African General Hospital, and after some service with that unit in England proceeded with it to France. Although nearly 60 years of age, Major Wilson was of too energetic a temperament to remain with a general hospital, and after serving with the unit for a

short period he effected an exchange so as to be attached to the South African Heavy Artillery, and he also did short spells of duty with the cavalry and South African Field Ambulance. He died as a result of a fall from his horse.

Major Wilson leaves a widow and several children, one of whom is serving overseas in the Royal Flying Corps.

W. R. ASPINALL, M.B., CH.M. SYD.,
MILITARY CROSS,
CAPTAIN, AUSTRALIAN ARMY MEDICAL CORPS.

Captain W. R. Aspinall, who was killed on active service last July at the age of 25 years, was youngest son of the Rev. A. Aspinall, M.A., of Sydney, N.S.W. He was educated at the Scots' College, and from there passed to Sydney University. Here he showed a keen interest in all branches of athletics, and won his football "Blue" in his second year. He was captain of the team when war broke out, and the same year played for New South Wales. He also took a leading position in the social life of the University, and was elected Vice-President of the Union. Graduating M.B., Ch.M. with honours in September, 1915, he was appointed house surgeon at Sydney Hospital.

Early in 1916 he joined up, and served some time in Egypt before being invalided to England with pneumonia. He went to France later in the year, and after serving some months with a field ambulance on the Somme, was attached to a field artillery brigade. After several months of consistently fine work, he was awarded the Military Cross for conspicuous gallantry under most trying circumstances. During a serious attack he worked all day under heavy machine-gun and shell fire without cover, tending friend and foe alike, with absolute disregard for his own safety. He was killed at his guns. In the trenches, as in other walks of life, he set a standard of personal courage and cheerfulness under all conditions that gained him universal respect.

ARMY MEDICAL TRAINING IN AMERICA.—A correspondent writes from the Medical Officers' Training Camp, Fort Benjamin Harrison, Indiana: "We are getting a great amount of thorough instruction. The ground is gone over rapidly, possibly because of the shortness of time allowable before our services are needed. The men are buckling down, and almost without exception are earnest and patriotic in their work. It is a remarkable thing to see popular and successful physicians and surgeons giving up fine incomes and living in this great army training camp and putting up cheerfully with its lack of conveniences. There are some 1200 M.D.'s here now, besides line officers, all getting ready to go out to care for and train the hundred thousands of our new draft army."

THE NATIONAL WAR AIMS COMMITTEE'S LEAFLETS.—The National War Aims Committee has issued a series of leaflets of a very opportune sort. The first 15 are: (1) Prime Minister's Speech; (2) Interview with General Sir W. Robertson; (3) What Are We Fighting For?; (4) There Must Be No "Next Time"; (5) Winning the War; (6) The Nation Made War and the Nation Must Make the Peace; (7) The Truth About the War; (8) Labour and the War; (9) President Wilson on Peace Terms and War Aims; (10) The Kaiser Manner; (11) The Greatest and the Last Crusade; (12) "Gentlemen" of Germany; (13) Peace at Germany's Price?; (14) Right and Might: a Lesson which Germany Must be Made to Unlearn; (15) A Kalendar of "Kultur." Of these, No. 10, The Kaiser Manner, consisting of only one leaf, is perhaps the one which will attract most attention, as most of the other speeches have been read in the daily newspapers more than once. The reverse of this leaf contains a reproduction, by the special permission of the proprietors of *Punch*, of a drawing by Bernard Partridge, entitled the "Knightly Manner," and depicts the Kaiser in armour standing over the prostrate body of the female personification of Belgium, who says, "As long as there is motion in my body and life to give me words I'll cry for Justice," to which the Kaiser replies, "Justice shall never hear you, I am Justice." This is explained parenthetically by a reminder as follows: ("There is no longer any international law."—The Kaiser to Mr. Gerard.) This powerful picture will entice the observer into a reverie of right and wrong, and truth and fiction; it is founded on a passage in Beaumont and Fletcher.

Correspondence.

"Audi alteram partem."

A STATE-AIDED MIDWIFERY SERVICE.

To the Editor of THE LANCET.

SIR,—The time has arrived when the question of the midwifery service of the country merits consideration. The Act of 1902 was mainly the work of "those who claim that they are generally considered to be most competent to advise on such a subject"—namely, the Fellows of the Royal College of Physicians of London. The very large majority of the medical profession were, and are, only too well aware that the subject is in the main one of economics, and can never be settled by the establishment of a State-controlled body of nurses.

The result of legislation has been that districts which cannot support a midwife have remained unprovided for, although a bulky tome is annually issued which contains the names of thousands of women who are licensed to practise. Improvement can only be obtained by a process of decentralisation. The money which is now spent upon the operations of the Midwives Board should be devoted to work carried on by sanitary authorities, and that Board should be abolished. Sanitary authorities have now organisations for carrying on the work and are quite competent to decide upon the fitness of the women they employ, and they should be subsidised out of the money saved by the extinction of the Midwives Board.

The attempt to make a new class of midwifery practitioners has failed, and if the establishment of such a class is desired a sufficiently equipped class must be made and the subject of midwifery removed from the compulsory subjects of medical students. At the present time midwives do not occupy a position which is quite fair to them. They are not considered to be competent to carry out their work without the aid of stringent rules and regulations. They consequently have no responsibility so long as these rules are obeyed. Some are incompetent and others competent, and no rules will make those competent who are incompetent. If a sufficient class must be obtained it must be a class who are so competent that their work can be carried on without rules and regulations.

The repeal of the Act of 1902 is urgently required.

I am, Sir, yours faithfully,

Hatfield, Oct. 1st, 1917. LOVELL DRAGE.

*** Dr. Lovell Drage attributes much to Fellows of the Royal College of Physicians of London. The General Medical Council, after deliberations in which the representatives of all the medical faculties and corporations took part, suggested many changes in legislation in the Bill which later became law. The question to which he alludes has already become urgent, and we publish this week notes on the course taken in St. Pancras and at Chelmsford.—ED. L.

SACRO-ILIAC STRAIN.

To the Editor of THE LANCET.

SIR,—I beg permission to contribute a few observations on the annotation in your issue of Sept. 29th on the above-named condition. It is true indeed "a lesion which the general practitioner often sees but fails to recognise," but whether this is "because it has been described only in recent years, mainly by American orthopædic surgeons," is open to question. A much more potent reason is that it has not been accepted as a clinical entity by English surgeons at all. When I read a paper[1] on the subject, with numerous references to the literature and notes of nine cases, before the Orthopædic Section of the Royal Society of Medicine in 1913, it was greeted with buckets of cold water, the President cynically remarking that in all his experience he had never been fortunate enough to meet with a single case; and when I have tried to interest others in this condition I have been received with looks of blank incredulity. The condition, of course, undoubtedly exists, and the medical profession should be most grateful to you for making it known. Its dominant feature, however, is not pain over "the sacro-iliac point" in front, but

[1] See Transactions of the Royal Society of Medicine, vol. vii.

pain over the sacro-iliac joint behind. I have seen many cases now, but never one in which this sign was absent.

As regards treatment, does not your annotation present altogether too rosy a view? "Treatment is simple and gives most satisfactory results." I have found treatment most difficult and disappointing, having only been able to cure completely two cases. The keynote of the treatment is to compress the two halves of the pelvis together, but in actual practice this is not easy. Encircling strips of plaster applied tightly cause sores at their edges after one or two days, and have to be left off while the sores heal; belts have all proved unsatisfactory, while manipulation under an anæsthetic relieves for a time, only to be followed by a recurrence of the trouble. The best apparatus has proved to be an ordinary corset with reinforcing webbing bands around the pelvis.

Finally, as to nomenclature. For reasons I do not propose to enter into here, there are many objections to the term "sacro-iliac *strain*." These are all got over by describing the condition as "*painful* sacro-iliac joint."

I am, Sir, yours faithfully,

Harley-street, W., Sept. 29th, 1917. PAUL BERNARD ROTH.

A WAR MEMORIAL TO OLD EPSOMIANS.

To the Editor of THE LANCET.

SIR,—Two informal meetings of old Epsomians have been held regarding the question of raising a memorial to old Epsom boys who have fought and fallen in this war. It was decided that a meeting should be held at the offices of the College, 37, Soho-square, London, W., at 4 P.M., on Friday, Oct. 12th. It is hoped to get an expression of opinion at that meeting as to whether such a memorial should be raised, how it should be raised, and what form such a memorial should take. A treasurer and secretaries for this memorial fund will be appointed. The Rev. W. Barton, the headmaster of the school, and myself are acting as secretaries until the regular appointments are made. As addresses are so uncertain it has seemed desirable to notify old Epsom boys of this meeting through the newspapers. Will all who can come to the meeting, and will those who cannot come express their views in a letter addressed to me?

I am, Sir, yours faithfully,

EDRED M. CORNER.

7, Harley-street, London, W.1, Sept. 28th, 1917.

A CASE OF PERIODIC ATTACKS OF PYREXIA.

To the Editor of THE LANCET.

SIR,—The case recorded by Dr. R. V. Solly under the above heading in your issue of Sept. 8th (p. 386) has considerable resemblance to one of rat-bite fever. The regular pyrexial attacks with high temperature and "well" intervals, the erythematous eruption, the cessation of the disease after the administration of galyl, and the seven-weeks' duration before the pyrexial attacks began to become irregular, all coincide closely with the course of a case of rat-bite fever.

I am, Sir, yours faithfully,

R. TANNER HEWLETT, M.D. Lond.

Chandos-street, W.C., Sept. 24th, 1917.

"RECONSTRUCTION."

To the Editor of THE LANCET.

SIR,—I have read with great pleasure the leading article entitled "Reconstruction" in your issue of Sept. 15th, and warmly welcome the suggestion of the formation of a board such as you put forward to consider and interpret facts relating to professional reconstruction after the war. Since the outbreak of war there has been a tendency on the part of certain of those remaining at home to try to create a new Heaven and new earth, in the absence of their betters, with themselves as archangels. This tendency has resulted in a complete revolution of our political electorate, and now threatens an equally drastic change in our professional status. Apart from the impertinence, which surely is sometimes evident, it is also an injustice. During the last two years I have been in many parts of the world, and I can only say that amongst the hundreds of medical officers that I have met there exists a real mistrust as to our future status—a general feeling that our interests are being neglected and that our future is being decided overmuch by the "indispensables" and the "embusquers," who suffer from glib tongues and lately from overweighted pockets. I hope that others will give you their views on the matter, especially those connected with medical units serving abroad.

I am, Sir, yours faithfully,

A. HURRELL STYLE, M.A., M.D. Cantab.,
Temporary Captain, R.A.M.C.

Royal Societies Club, St. James's-street, S.W., Sept. 28th, 1917.

THE SERVICES.

ARMY MEDICAL SERVICE.

Temp. Col. F. M. Caird (Lieutenant-Colonel, R.A.M.C.T.F.) relinquishes his temporary rank on re-posting.

Temporary Lieutenant-Colonels to be temporary Colonels: Sir T. Myles, C.B., Sir W. A. Lane, C.B., J. Swain, C.B., Sir B. G. A. Moynihan, C.B., W. Taylor, A. Carless, Sir A. Chance, A. W. Mayo Robson, C.V.O., C.B., C. J. Symonds, C.B., C.M.G., T. H. Openshaw, C.B., C.M.G., W. Hunter, C.B., W. Aldren Turner, C.B., H. M. Davy, C.B.

Honorary Lieutenant-Colonels to be temporary Honorary Colonels: J. L. Thomas, C.B., C.M.G., J. F. O'Carroll.

ROYAL ARMY MEDICAL CORPS.

Major A. N. Fraser, D.S.O., to be temporary Lieutenant-Colonel whilst commanding a Training Centre.

Temp. Major R. Davies-Colley to be temporary Lieutenant-Colonel whilst specially employed.

Major (Bt. Lieut.-Col.) H. J. Crossley to be acting Lieutenant-Colonel whilst in command of a Stationary Hospital.

Major (Bt. Lieut.-Col.) H. J. Crossley relinquishes the rank of acting Lieutenant-Colonel on re-posting.

Major (Bt. Lieut.-Col.) C. R. S. Bradley relinquishes the rank of temporary Lieutenant-Colonel on ceasing to command a Training Centre.

Temp. Capt. E. P. G. Causton to be temporary Major.

H. H. K. Sparrow and P. A. Sullivan, late temporary Captains, to be honorary Captains.

Temp. Lieuts. to be temporary Captains: H. McLean, R. A. Campbell, R. A. MacNeill, G. H. Fraser, J. M. Johnstone, J. J. Moriarty, T. T. B. Watson, T. H. Jackson, J. A. Noble, J. H. Sharpe, W. E. Hodgins, A. S. Carter, T. Jones, A. H. Davies, R. H. Stoddard, E. E. T. Nuthall, F. P. Wigfield, F. Stevenson, J. McN. Murray, V. E. Somerset, J. C. M. Bailey, R. K. G. Graves, F. Newey, N. N. Haysom, E. G. Howell, C. H. Comerford, R. J. MacKessack, P. Pollard, J. A. Renshaw, A. H. H. Howard, D. G. S. Gartshore, L. C. Blackstone, C. S. U. Rippon, H. D. Stewart, A. Fothergill, H. V. Taylor, J. G. Johnstone, M. C. Stark, C. D. Day, J. W. Steel, R. W. Annison, K. H. Stokes, W. A. Simpson, J. Warnock, J. E. P. Shern, N. C. Lake, C. F. Graves, A. S. Holden, A. H. Burnett, C. C. Morgan, N. Davidson, A. C. Craighead, T. L. Henderson, A. Kerr, W. C. Fraser, K. McLay, W. W. Johns, W. S. Angus, H. G. E. Williams, J. B. Whitfield, J. M. Jarvie, F. W. Murray, R. J. Wilson, J. D. Judson, W. R. Wiseman, D. G. C. Tasker, G. E. A. Petrie, H. F. Woods, A. Duguid, R. S. Barker, W. L. Johnson, F. W. Grant, C. Tylor, P. Henderson, G. A. Lyons, T. D. H. Holmes, T. Jackson, H. S. Banks, F. G. Bergin.

To be temporary honorary Lieutenants: B. E. Hawke and C. H. Evans.

Officers relinquishing their commissions: Temp. Major W. D. Knocker (on account of ill-health); Temp. Capts. F. W. Lyle (granted the honorary rank of Captain), H. de C. Dillon (on acount of ill-health contracted on active service; granted the honorary rank of Captain), M. A'B. McCarthy (granted the honorary rank of Captain), J. Brunton, N. Grace, S. G. Vinter, C. H. Brookes, J. S. S. Perkins, A. H. H. Sinclair, W. J. Hicks, W. J. Gow, C. D. Pile, F. C. Drew, A. S. Anderson, A. G. Watson, Temporary Lieutenants: P. E. Howie (on account of ill-health), A. T. Thurston, R. Lee, R. Jones, D. Penman, G. Holman, J. Mellor, W. S. Kidd, H. W. Heasman, N. F. Stallard, W. H. Gray, J. R. Kerr, J. Loftus, A. F. Martin, M. Waldron, J. S. F. Weir, J. Findlay, R. S. Doran, C. H. Houghton, H. Nicol, R. H. Jamieson, T. H. Underhill, T. A. Matthews, J. M. Hall, E. J. Fitzgerald, H. G. Ramsbottom, W. E. Bramley-Moore, H. A. Fenton, S. J. Yeates, J. H. C. Thompson, S. J. Moore, W. S. McDougall, J. T. Bailey, W. McM. Millar, H. H. Hiley, E. G. Fearnsides, T. G. Maitland, J. E. Richards, G. F. Longbotham, J. B. McCutcheon, J. D. S. Sinclair, W. Garstang, J. R. Frost, E. W. Atkinson, G. R. Hughes, J. R. Micallef, A. Kinsey-Morgan.

SPECIAL RESERVE OF OFFICERS.

Second Lieut. S. Riddiough, from Unattached List, T.F., to be Lieutenant.

TERRITORIAL FORCE.

Major (temp. Lieut.-Col.) E. H. Cox relinquishes his temporary rank on ceasing to command a Field Ambulance.

Capt. C. E. Silvester to be Major.

Capts. T. M. Jamieson and E. H. E. Stack are restored to the establishment.

Capt. (temp. Major) W. B. Secretan relinquishes his temporary rank on alteration in posting and is restored to the establishment.

Capts. H. N. Fletcher and F. A. S. Hutchinson are seconded for duty with a General Hospital.

Capt. J. D. Holmes is restored to the establishment.

Second Lieut. C. P. Matthews, from East Surrey Regiment, to be Lieutenant.

F. Isdell to be temporary Lieutenant and Medical Officer, 4th Battalion, Essex Volunteer Regiment.

JAPANESE ORDER.

The Order of the Sacred Treasure of the First Class has been conferred on Surg.-Gen. Sir Arthur William May, K.C.B., K.H.P., by the Emperor of Japan.

Medical News.

VICTORIA UNIVERSITY OF MANCHESTER.—At the First M.B. and Ch.B. examination, held recently, the following candidates were successful:—

Part I., Inorganic Chemistry and Physics.—R. S. van Aalten, O. A. Akjaly, Nancy E. Beakley, Caroline M. Edwardes-Evans, T. N. Fisher, Kath. M. Fullerton, Ruth Hill, C. D. Hough, Jessie Kilroe R. R. Lane, W. L. Martland, A. C. Newman, El. S. El. G. Sheir, Mary I. Turner, and Leo Unsworth.

Part II., Biology.—O. A. Akjaly, Cath. M. E. S. Chapman, and Emmeline Wade.

Chemistry.—Cath. M. E. S. Chapman and Emmeline Wade.

MEDICAL SOCIETY OF LONDON.—The programme of the first half of the session 1917-18 has now been issued. The annual meeting, as announced, will take place on Oct. 8th, at 8 P.M. The address of the President, Sir StClair Thomson, on "The Founder and the Foundation of the Medical Society," will be delivered at 8.30, and will be followed by a discussion on "War Bread and its Effect on Health," to be introduced by Dr. Robert Hutchison and Dr. E. I. Spriggs. On Oct. 22nd a discussion on "Modern Artificial Limbs and their Influence upon Methods of Amputation" will be introduced by Mr. Muirhead Little and Captain R. C. Elmslie, R.A.M.C. (T.). On Oct. 29th a paper will be read on "Experiences in the Use of Nitrous Oxide and Oxygen with Regulated Rebreathing in Military Surgery at the First London General Hospital," by Captain H. Edmund G. Boyle, R.A.M.C. (T.). On Nov. 12th and 19th there will be a discussion on "The Value and Limitations of Sanatorium Treatment for Tuberculosis," in which Dr. T. D. Lister, Dr. David Lawson, Dr. Noel Bardswell, and Dr. Wilfred O. Meek will take part. On Dec. 3rd a discussion on "Surgical and Dental Treatment of Severe Facial Injuries" will be introduced by Major H. D. Gillies, R.A.M.C., Captain Kelsey Frey, R.A.M.C. (T.), and Mr. Percival Cole. All the ordinary meetings will be held at 8.30 P.M. The Lettsomian lectures on "Jaundice" will be delivered in the spring of 1918 by Colonel William H. Willcox, C.B., C.M.G. The annual Oration will be delivered by Colonel Charles A. Ballance, C.B., M.V.O., in May, 1918. The syllabus for the second half of the session will be published early in January, and Fellows desirous of reading papers should communicate with Mr. Hugh Lett, the senior honorary secretary, at 11, Chandos-street, Cavendish-square, W.1.

NORTH-EAST LONDON POST-GRADUATE COLLEGE.—A series of demonstrations has been arranged for the winter session, 1917, at the Prince of Wales's Hospital, Tottenham, to which all medical men are invited. The subjects are as follow: Nov. 6th, Mr. C. H. Hayton, Nose, Ear, and Throat Disease; Nov. 13th, Mr. J. Howell Evans, Abdominal Injuries; Nov. 19th, Dr. T. R. Whipham, Children's Diseases; Nov. 27th, Dr. A. J. Whiting, Medical Cases; Dec. 5th, Mr. T. H. C. Benians, Disease Carriers. The time in each case is 3.30 P.M.

KING EDWARD'S HOSPITAL FUND FOR LONDON: STATISTICAL REPORT.—The need for and benefits of economy which the nation is now realising, owing to the exigence of war, have for several years been thoroughly recognised by all who are interested in the welfare of our great healing institutions, and since the advent of King Edward's Hospital Fund for London the economy of hospital administration redounds to the credit of all concerned. With the object of assisting hospital managers and others in controlling expenditure the King's Fund, as our readers know, issues an annual statistical report, and that for the year 1916 (the fourteenth), dealing with the ordinary expenditure of 109 London hospitals, which has just been issued, clearly demonstrates the need for support and the worthiness of these institutions for the sick poor and for the healing of our sailors and soldiers. In 1916 the total number of beds in average daily occupation was 11,406, while the total number of in-patients admitted was 153,512 and the number of out-patients attended 1,251,019. Of the in-patients 27,328 were naval and military patients treated by understanding with the authorities, and the 2855 beds thus occupied represented 25 per cent. of the total average occupied beds. The total average number of occupied beds was raised from 9766 in 1913 to 11,406 in 1916, an increase of 1640 beds, from which it follows that 1215 of the number of beds occupied by the naval and military patients were taken from those previously used by civilians, the remaining 1640 beds for war patients being provided for by an increase in the total accommodation at the hospitals. The total ordinary expenditure during the year, including maintenance, administration, rent, rates, and taxes, but excluding capital expenditure, interest on borrowed money, and contributions to the maintenance of convalescent homes and country branches, amounted to £1,513,834. The receipts from the authorities in aid of naval and military patients was £218,037. Comparing the year 1916 with 1915 the increased expenditure borne by the hospitals amounted to £104,540, or 8·77 per cent., caused almost entirely by the rise in cost of all items of maintenance. As is pointed out by the secretaries of the Fund, "the increase in total work, with the consequent increase in total expenditure, constitutes an enlarged demand upon the voluntary subscriptions of the charitable public, and renders more than ever important the grants made by this Fund and by the Hospital Sunday and Saturday Funds." The report can be obtained from Messrs. Spottiswoode, Ballantyne, and Co., 1, New Street-square, E.C. 4, price 1*s.* net, or 1*s.* 2*d.* post free.

MEDICO-LEGAL SOCIETY: SESSION 1917-1918.—A meeting will be held at 11, Chandos-street, Cavendish-square, W., on Tuesday, Oct. 16th, at 8.30 P.M., the Right Hon. Sir Samuel Evans, president of the society, in the chair. After the presidential address a discussion will take place on the Criminal Law Amendment Bill (1917), introduced by Dr. F. J. Smith. Members desirous of participating in the discussion should communicate their names to Dr. F. G. Crookshank, 15, Harley-street, W.1, the senior honorary secretary, before the meeting. The presence of visitors interested in the subject will be welcomed.

PRESENTATION TO A MEDICAL MAN.—Mr. James Munce, medical officer of Drumbeg Dispensary, co. Down, was on Sept. 28th, at Hillhall schoolhouse, presented with a packet of Treasury notes and a gold pin, and his wife with a piano, as indications of personal appreciation on the part of a wide circle of patients and friends, the occasion of the presentation being the doctor's recovery from a severe illness.

DOCTORS CALLED IN BY MIDWIVES.—The St. Pancras borough council proposes for an experimental period of one year to make payments to medical practitioners when called in by midwives in cases of emergency upon the statement of the medical practitioner that the patient is in his opinion unable to pay. Subject to its being accepted by the local branch of the British Medical Association the scale of payment to the medical practitioners will be fixed as follows: 1 guinea for a normal confinement and 2 guineas for a confinement presenting special difficulty or requiring operative interference, including in each case the necessary subsequent attendances, and for calls not for the confinement itself, but before or after confinement 5*s.* for the first visit (10*s.* 6*d.* if between 9 P.M. and 9 A.M.) and 2*s.* 6*d.* for each subsequent visit. In his report on the subject Dr. T. Shadick Higgins, the medical officer of health of the borough, says that for the avoidance of payment from public funds in cases where it could be made by the patient, the scheme would depend upon the doctors refraining from asking for fees from the council in such cases; but for the success of the scheme it is essential that the doctors should be assured of payment by the council if they render an account with a statement of their opinion of the inability of the patient to pay. The scale of payment set out above can be taken as a basis, but before a scheme is adopted it would be necessary to get not only the concurrence of the local practitioners but also the approval of the Local Government Board.

URBAN VITAL STATISTICS.

(Week ended Sept. 29th, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 10·8, against 10·6 and 11·1 per 1000 in the two preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 11·2, or 0·1 per 1000 above that recorded in the previous week; among the remaining towns the death-rates ranged from 4·1 in Aberdare, 4·4 in Enfield, and 5·0 in Dewsbury, to 15·8 in Newport (Mon.), 16·2 in Acton and in Rochdale, and 17·3 in Tynemouth. The principal epidemic diseases caused 397 deaths, which corresponded to an annual rate of 1·2 per 1000, and included 267 from infantile diarrhœa, 47 from whooping-cough, 35 from diphtheria, 29 from measles, 14 from enteric fever, and 5 from scarlet fever. The deaths from diarrhœa, which had been 320, 262, and 344 in the three preceding weeks, declined to 267, and included 55 in London, 19 in Liverpool, 16 in Hull, 15 in in Sheffield, and 11 in Sunderland. The 816 cases of scarlet fever and 1123 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were respectively 84 and 41 above the numbers remaining at the end of the previous week. Of the deaths from all causes in the 96 towns, 146 resulted from violence. The causes of 16 deaths were uncertified, of which 4 were registered in Liverpool and 2 each in Birmingham and Gateshead.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual rate of mortality was equal to 11·9, against 10·8 and 11·6 per 1000 in the two preceding weeks. The 256 deaths in Glasgow corresponded to an annual rate of 12·0 per 1000, and included 13 from infantile diarrhœa, 5 from whooping-cough, and 2 from diphtheria. The 85 deaths in Edinburgh were equal to a rate of 13·4 per 1000, and included 3 from whooping-cough and 1 from diphtheria.

Irish Towns.—The 96 deaths in Dublin corresponded to an annual rate of 12·5, or 4·1 per 1000 below that recorded in the previous week, and included 16 from diarrhœa, 2 each from whooping-cough and diphtheria, and 1 from enteric fever. The 81 deaths in Belfast were equal to a rate of 10·7 per 1000, and included 2 from diarrhœa.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

HICHENS, F., M.D. Lond., has been reappointed Medical Officer for Stythians by the Redruth Board of Guardians.

MEACHEN, G. N., M.D., B.S. Lond., has been appointed Tuberculosis Officer for the Saffron Walden and Braintree District of Essex.

SIMPSON, S., M.B., B.Ch. Dub., District Medical Officer and Public Vaccinator for the parish of Llanelly, Brecon.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BETHNAL GREEN, METROPOLITAN BOROUGH OF.—Female Assistant Medical Officer of Health. Salary £400 per annum.

BIRKENHEAD BOROUGH HOSPITAL.—Junior House Surgeon. Salary £175 per annum, with board, &c.

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.—Resident Medical Officer and House Surgeon. Salary £200 and £150 per annum respectively each, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

BURY INFIRMARY.—Junior House Surgeon. Salary £150 per annum, with board, &c.

CAMBRIDGE, ADDENBROOKE'S HOSPITAL.—House Surgeon and House Physician. Salary at rate of £300 per annum each, with board, &c.

CHARING CROSS HOSPITAL.—Medical Registrar. Salary £60 per annum, with lunch and tea.

COLMONELL PARISH, LOWER DISTRICT OF.—Medical Officer. Salary £70 per annum. Vaccination salary £2 per annum.

DERBY, DERBYSHIRE ROYAL INFIRMARY.—Resident Surgical Officer.

KENSINGTON BOARD OF GUARDIANS.—Resident Medical Superintendent for Marloes road Institutions. Salary £650 per annum, with use of house, &c.

LIVERPOOL INFIRMARY FOR CHILDREN.—Two Resident House Physicians for six months. Salary at rate of £90 per annum each, with board, &c.

LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W.—Assistant Resident Medical Officer. Salary £120 per annum, with board, &c.

NEW HOSPITAL FOR WOMEN, Euston-road.—Female Resident Medical Officer at House of Recovery, New Barnet. Salary £60 per annum, with board, &c.

NOTTINGHAM GENERAL HOSPITAL.—Female House Surgeon for six months. Salary at rate of £250 per annum, with board, &c.

NOTTINGHAM AND MIDLAND EYE INFIRMARY.—Female House Surgeon. Salary £200 to £250 per annum, with board, &c.

OLDHAM ROYAL INFIRMARY.—Third House Surgeon. Salary £225 per annum, with board, &c.

OXFORD EYE HOSPITAL.—Resident House Surgeon.

PORTSMOUTH BOROUGH MENTAL HOSPITAL.—Locum Tenens Assistant Medical Officer. Salary 7 guineas per week, with board, &c.

PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N.—Senior House Surgeon. Salary at rate of 7 guineas per week, with board, &c.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—House Physician, Casualty House Surgeon, and House Surgeon for six months. Salary £100 per annum, with board, &c.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street W.—Resident House Surgeon. Salary £100 per annum, with board, &c.

SALISBURY GENERAL INFIRMARY.—House Surgeon. Salary £150 per annum, with board, &c.

SHEFFIELD ROYAL INFIRMARY.—Casualty Officer for six months. Salary £150 per annum, with board, &c.

SOUTHAMPTON, FREE EYE HOSPITAL.—House Surgeon. Salary £100 per annum, with board, &c.

SOUTHAMPTON, ROYAL SOUTH HANTS AND SOUTHAMPTON HOSPITAL.—House Physician.

WALSALL AND DISTRICT HOSPITAL.—Female Assistant House Surgeon and Anæsthetist. Salary £175 per annum, with board, &c.

WALSALL EDUCATION COMMITTEE.—Temporary School Medical Inspector. Salary at rate of £400 per annum.

WEST BROMWICH DISTRICT HOSPITAL.—Senior House Surgeon, unmarried. Salary £160 per annum, with board, &c.

WHITEHAVEN TOWN COUNCIL AND RURAL DISTRICT COUNCIL.—Medical Officer of Health. Salary £500 per annum.

WINCHESTER, HAMPSHIRE COUNTY COUNCIL.—Temporary Assistant County Medical Officer of Health. Salary £400 per annum.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Hastings (Sussex) and at Cleator (Cumberland).

Births, Marriages, and Deaths.

BIRTHS.

HUTCHINSON.—On Sept. 26th, at Lower King's-road, Kingston-on-Thames, the wife of Major E. L. Hutchinson, A.A.M.C., of a daughter.

ROSS HADDON.—On Sept. 25th, at Overstrand-mansions, S.W., the wife of Captain D. A. Ross Haddon, M.C., R.A.M.C., of a daughter.

WARREN.—On Sept. 22nd, at Arden Cottage, Greenford-gardens, Greenford, Southall, to Captain and Mrs. Richard Warren, of 23, Wimpole-street, W. a daughter.

MARRIAGES.

ARMOUR—JOHNSTON.—On Sept. 27th, at St. Luke's Church, Liverpool, T. Armour, M.B., F.R.C.S. Ed., Captain, R.A.M.C., T.F., to Margaret Johnston, daughter of the late Mr. H. Johnston.

HILTON JONES—DAVIES BRYAN.—On Sept. 25th, at Engedi C.M. Chapel, Carnarvon, Captain R. Orthin Hilton Jones, M.C., R.A.M.C., to Olwen, only child of Mr. and Mrs. Edward Davies Bryan, of Cairo, Egypt, and Carnarvon.

PARKINSON—LE BROCQ.—On Sept. 29th, at St. Michael's Church, Southampton, John Parkinson, M.D., M.R.C.P., Temporary Captain, R.A.M.C., to Clara Elvina Le Brocq, late Sister Q.A.I.M.N.S.R.

DEATHS.

BULL.—On Sept. 16th, killed in action, Captain B. A. Bull, R.A.M.C., attached London Regiment.

HARDIE.—On Sept. 20th, died of wounds, Captain F. Hardie, R.A.M.C. (T.).

ROBERTS.—On Sept 27th, Arthur Milson Roberts, M.D., aged 69.

WALKER.—On Sept. 30th, at Edgbaston, R. P. Walker, M.R.C.S. Eng., L.S.A., in his 84th year.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

BOOKS, ETC., RECEIVED.

LEA AND FEBIGER, Philadelphia and New York.
The Treatment of Diabetes Mellitus, with Observations upon the Disease, based upon 1300 Cases. By E. P. Joslin, M.D. Harv. Second edition, revised. $4.50.

LONGMANS, GREEN, AND CO., London; University Press, Manchester.
Founders' Day in War Time. An address delivered on March 23rd, 1917, at a memorial service for members of Manchester University who have fallen in the War. By Sir Adolphus William Ward, Litt.D., F.B.A. 1s. 6d. net.

MACMILLAN AND CO., London.
Human Physiology. By Professor Luigi Luciani (Rome). Translated by F. A. Welby, with Preface by J. N. Langley, F.R.S. Vol. IV. Edited by Gordon M. Holmes, M.D. The Sense Organs. 21s net.

MENTAL CULTURE ENTERPRISE, 329, High Holborn, W.C.1.
The Principles of Rational Education. By Charles A. Mercier, M.D., F.R.C.P., F.R.C.S. 2s. 9d. net.

PITMAN, SIR ISAAC, AND SONS, London.
Soap: its Composition, Manufacture, and Properties. By W. H. Simmons, B.Sc. Lond., F.C.S. 2s. net.

PUTNAM'S (G. P.) SONS, London and New York.
Hygiene in Mexico. A Study of Sanitary and Educational Problems. By Alberto J. Pani, C.E. Translated by Ernest L. de Gogorza.

SANITARY PUBLISHING COMPANY, London.
Sanitary Law and Practice. By W. Robertson, M.D. Glasg., D.P.H., and Charles Porter, M.D., B.Sc., M.R.C.P. Edin. Fourth edition, revised. 12s. 6d. net.

UNIVERSITY OF CHICAGO PRESS, Chicago.
Food Poisoning. By Edwin Oakes Jordon, Chairman of the Department of Hygiene and Bacteriology, University of Chicago. $1 net.

WRIGHT, JOHN, AND SONS, Bristol.
Blood Pictures. An Introduction to Clinical Haematology. By Cecil Price-Jones, Captain, R.A.M.C. (T.). 6s. 6d. net.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Oct. 3rd, 1917.

Date.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
Sept. 27	0·05	99	67	52	52	53	Fine
,, 28	...	89	64	50	52	54	Fine
,, 29	...	102	66	52	53	54	Fine
,, 30	...	96	70	48	53	54	Fine
Oct. 1	...	92	70	50	51	52	Fine
,, 2	...	95	72	48	51	52	Foggy
,, 3	...	93	66	52	57	59	Raining

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.—The two Goldsmid Entrance Exhibitions, offered annually for competition in September, were awarded this year to Mr. H. L. Heimann and Mr. V. R. Khanolkar, both of University College, London.

IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY.—A course of lectures on Tropical Hygiene will be given by Mr. H. G. Plimmer, F.R.S., professor of comparative pathology, in the lecture-room of the Botany Department of the College, Prince Consort-road, South Kensington, London, S.W., on Tuesdays from 4–5 P.M., during the first half of the session 1917–18, beginning on Oct. 9th. The course is intended for officers in H.M. Forces who are likely to be sent to hot countries, and will deal with infectious diseases, their causation and prevention; advice as to the maintenance of health in tropics; and the treatment of minor complaints and injuries. The fee for the course is £1. Application to the Registrar of the Imperial College.

Notes, Short Comments, and Answers to Correspondents.

GILBERT AND ELLICE ISLANDS.

A REPORT recently presented to Parliament on these two groups of islands in the Pacific—formerly constituting a Protectorate, but formally annexed to the Empire in 1915—contains some interesting references to the health and medical administration of the territory. The Gilbert group, situated between 4° N. and 3° S. latitude and 172° and 177° W. longitude, consists of 16 islands, with several smaller islands or islets depending upon them; and the Ellice group, between 5° S. and 10½° S. latitude and 176° E. and 179° 58° W. longitude, consists of nine islands (in which Ocean Island, or Paanopa, is included). The total area of the two groups is only 180 square miles, and the population, according to the Census of 1911, comprised 30,523 natives, 301 Asiatics, and 297 Europeans. The births recorded in 1915–16 totalled 959 and the deaths 726.

In the Gilbert Islands a serious epidemic of influenza carried off many old people and weaklings in 1914-15, but the figures for 1913–14 and 1915–16 were most satisfactory in view of the fact that for many years previously the population of the islands was decreasing to such an extent that it was predicted that the race would soon be exterminated owing to contact with civilisation. It is true that the white man introduced syphilis and was probably responsible for the scourge of tuberculosis, but medical science is using every effort to restore the balance and to bring relief and improved health to these simple and kindly folk. During the past three years the expenditure on the medical department has been very largely increased. There was a time when sickness was hidden and when medical inspection visits were feared. In 1913–14 a determined effort was first made to put the medical department on a sound footing. It was realised that this result could not be achieved by the importation of medical skill only; it was essential to catch and to hold the interest and confidence of their own people, to demonstrate that the power to alleviate and to heal could be learnt by their kith and kin, and that operations were not hazardous miracles to be performed in secret under the white man's spell. It is already evident from statistics that some measure of success is being attained. In spite of the difficulty of transport due to the need of a Government vessel and to the curtailment of the trading steamer service in war time, the number of cases admitted into the hospitals and the operations performed are proof that these people have realised what medical attention can do for them.

The results of the treatment of yaws by salvarsan, or by its equivalent galyl or kharsivan, confirm the reports from the West Indies and elsewhere. The native name given to this drug is "Te Iti" or "lightoing," from the marvellous rapidity of the cure. Satisfactory results have also been obtained by the use of this drug in cases of syphilis, which is prevalent still in the groups; this, however, is naturally a slower process, especially in its advanced stages. It is, unfortunately, still difficult to get the patient to realise the gravity of this disease in the early stages. The need for a plentiful supply of galyl or kharsivan cannot be too earnestly insisted on. In cases of elephantiasis, prevalent in several of the islands, kharsivan has also been used with good results.

The treatment of tuberculosis, the greatest scourge of the colony, is a matter which calls for the patience and perseverance of those on the spot. Tuberculin may be used in surgical cases, but the various precautionary measures do not appeal to the careless, easy-going native. Tuberculosis is believed to have been originated amongst these people by the wearing of European dress, which led to the discontinuance of the practice of oiling the bodies, which was formerly done as soon as the cold westerly winds set in with heavy rains. Though efforts have been made to persuade the natives to revert to their native dress and to the lubrication of the body, it is feared that the attempt has been made too late. It is natural that the traders are averse to this, since probably 50 per cent. of the money which they pay out for produce comes back to them from the sale of tropical clothing to natives. The missions also have shown no wish to help this movement. "Shirts and trousers for men, and the long-sweeping garment for women, are the outward signs of Christianity; it is practically only among pagans and in the Government gaols that the sensible native dress may now be seen."

The headquarters of the medical staff are at Tarawa, with branch European-run hospitals at Tabiteanea in the Central Gilberts and at Funafuti in the Ellice group. The institution of a training school for native medical students at Tarawa has proved a great boon to the colony. The natives have come forward readily for instruction, and every island is now in charge of a medical dresser of fair experience. As opportunities of relief offer these dressers return to the Central Hospital for a further period of instruction, and the standard of efficiency is gradually raised throughout the native hospitals. During the year 1175 cases were admitted to the Tarawa Central Hospital and 619 operations were performed. At the Funafuti hospital 555 cases were admitted and 180 operations performed. Since November, 1915, the European medical staff has again been reduced to one; this officer is, however, ably assisted by two native medical practitioners, to one of whom (Sowani) the colony is indebted for many years of most faithful and efficient service. The services of a white matron have now been acquired for the Tarawa hospital, and a scheme for the training of half-caste girls as maternity nurses has been started. During the year a white ward for the treatment of European patients has been opened and has already proved useful.

The erection and equipment of a leper asylum upon an isolated islet awaits acquisition of a Government vessel for the collection of cases. Each island is at present equipped with its own asylum, but there is always danger of contact or intercourse, and this scourge cannot be wiped out until a central isolated asylum can be constructed and maintained with the assistance of a Government vessel

THE SUPER-HEN.

To the Editor of THE LANCET.

SIR,—Amongst some eggs which I bought last week there was one which was rather large, and which I voted was the progeny of a goose and included in my purchase by mistake. On cracking it it yielded two fine yelks. I used to look after a number of hens for several years and collect their eggs and cook a good many, but although I have seen some curious specimens of twisted and fantastic-shaped shells, and of shell-less eggs, I have not met with one before having two yelks.

I have had the curiosity since to look for information in your columns. In THE LANCET of Sept. 26th, 1885, there is an account of a hen's egg with two shells, one inside the other; and in the issue of Dec. 5th, 1885, a letter describes an egg with two shells, each shell when broken yielding yelk and white; and in that of Oct. 17th, 1885, a correspondent wrote that his medical partner had a similar egg and requested Professor Huxley's opinion on it. "It is very simple," said Huxley, "reversed peristaltic action takes place in the oviduct after the shell is formed; the egg is driven back, and when again descending gets a coating of yelk, albumen, and shell." But I do not see any record of a double yelk mentioned.—I am, Sir, yours faithfully,

Oct. 3rd, 1917. A READER.

A CORRECTION.

To the Editor of THE LANCET.

SIR,—May I correct a statement in your reviewer's extremely considerate remarks upon the last edition of my little book on anæsthetics? Anoci-association is not omitted, as he states, but is briefly described in the pages headed "Nitrous Oxide and Oxygen in Major Surgery." But the word does not occur in the index.

I am, Sir, yours faithfully,

Harley-street, Oct. 2nd, 1917. J. BLOMFIELD.

Medical Diary for the ensuing Week.

SOCIETIES

MEDICAL SOCIETY OF LONDON, 11, Chandos-st., Cavendish sq., W.

MONDAY.—8 P.M., Annual General Meeting. 8.30 P.M., Presidential Address:—Sir StClair Thomson: The Founder and Foundation of the Medical Society. Discussion on War Bread and its Effects on Health (introduced by Dr. R. Hutchison and Dr. E. I. Spriggs).

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. E. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham): Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).

WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. E. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

The following journals, magazines, &c., have been received:—British Journal of Ophthalmology, Philippine Journal of Science, American Journal of Orthopædic Surgery, La Riforma Medica, Surgery, Gynecology, and Obstetrics, American Journal of Obstetrics, Practitioner, London Hospital Gazette, St. Bartholomew's Hospital Journal, American Journal of Surgery.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET should be addressed "To the Manager."

We cannot undertake to return MSS. not used.

Offices: 423, STRAND, LONDON, W.C. 2.

MANAGER'S NOTICES.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C. 2, are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will ensure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

THE COLONIAL AND FOREIGN EDITION is published in time to catch the weekly Friday mails to all parts of the world.

TO COLONIAL AND FOREIGN SUBSCRIBERS.

Subscribers abroad are particularly requested to note the rates of subscriptions given on page 4.

The Manager will be pleased to forward copies direct from the Offices to places abroad at the rates shown, whatever be the weight of any of the copies so supplied.

Communications, Letters, &c., have been received from—

A.—Messrs. Allen and Hanburys, Lond.; Capt. A. Anderson; *L'Argus de la Presse*, Paris; Anglo-French Drug Co., Lond.; Lieut.-Col. J. G. Adami, A.D.M.S.; Messrs. Claudius Ash, Sons, and Co., Lond.;

B.—Dr. F. L. Benham, Semaphore; Capt. W. E. Bullock, R.A.M.C.; Basford Rural District, Council, Clerk to the; Messrs. Brown Bros., Lond.; Bolingbroke Hospital, Lond., Sec. of; Messrs. Butterworth and Co. Lond.; British Medical Association (Queensland Branch), Brisbane, Sec. of; Mrs. Barrett, Neston; British Red Cross Hospital, Lond., Commandant of; Messrs. Blinko and Sons, Ramsgate; Sir Thomas Barclay, Birmingham; Mr. T. H. C. Benians, Croydon; Board of Education, Lond., Sec. of; Major W. Broughton-Alcock, R.A.M.C.; Dr. L. W. Bathurst, Lond.; Capt. R. G. Brown, R.A.M.C.; Lieut. Norman Bradley, R.A.M.C.

C.—Mr. E. M. Corner, Lond; Major C. Christy, R.A.M.C.; Mr. W. Clough, Los Angeles; Messrs. Cowle and Co., Lond.; Messrs. J. and A. Churchill, Lond.; Capt. O. Carlyle, R.A.M.C.; Messrs. Callard and Co., Lond.; Cumberland Infirmary, Carlisle, Sec. of; Mr. J. Cabburn, Lond.; Dr. Charles Greene Cumston, Geneva; Dr. A. E. Carver, Torquay; Dr. H. Charles Cameron, Lond.; Capt. J. Campbell, R.A.M.C.

D.—Capt. J. P. Davies, R.A.M.C.; Capt. J. D. Dyson, R.A.M.C.; Messrs. W. Dawson and Sons, Lond.; Mr. J. L. Dick, Lond.; The Decimal Association, Lond.; Dr. V. Dickinson, Lond.; Mrs. H. Davidson, Weston-super-Mare; Dr. M. Davies, Old Colwyn; Mr. H. V. McM. Dillon, Derbyshire Royal Infirmary, Derby, Sec. of.

E.—Mr. P. A. H. Egerton, Leeds; Messrs. Elliott, Son, and Boyton, Lond.; Dr. W. Ettles, Lond.

F.—Dr. R. H. Fox, Lond.; Staff-Surg. P. Fildes, R.N.V.R.; Messrs. H. Frowde and Hodder and Stoughton, Lond.

G.—Sir A. Pearce Gould, Lond.; Mr. H. J. Gauvain, Lond.; Messrs. A. J. Greenly and Co., Lond.; Genatosan, Lond.; G. M. J.

H.—Surg. J. A. Hadfield, R.N.; Prof. R. T. Hewlett, Lond.; Capt. G. S. Hughes, R.A.M.C.(T.); Major F. T. G. Hobday, A.V.C.; Hunterian Society, Lond.; Mr. J. T. Henderson, Pietermaritzburg; Dr. W. J. Howarth, Lond.; Dr. G. D. Henderson, Holyoke; Hospital Saturday Fund, Lond.; Messrs. W. and R. Holmes, Glasgow; Dr. G. Hunter, Edinburgh; Miss Holloway, Nice; Holborn Advertising Service, Lond.; Mr. T. O. Hunter, Arequipa.

I.—Ilford Urban District Council; Incorporated Society of Trained Masseuses, Lond.; Sec. of.

J.—Mr. L. M. Judson, Lond.; Dr. C. J. Jennings, Detroit; Messrs. Morgan W. James and Co., Cardiff.

K.—Mr. L. J. Kidd, Lond.; Prof. A. Keith, Lond.

L.—Dr. R. W. Leftwich, Lond.; Dr. R. B. Low, Lond.; Dr. G. C. Low, Lond.; *La Riforma Medica*, Naples, Director of; Messrs. H. K. Lewis and Co., Lond.; Leeds Public Dispensary, Sec. of; Mr. W. Lock, Blackpool; Messrs. Longmans, Green, and Co., Lond.; Messrs. Lee and Nightingale, Liverpool.

M.—Dr. F. W. Mott, Lond.; Dr. A. P. Mitchell, Edinburgh; Dr. Dan McKenzie, Lond.; Dr. J. C. McVail, Edinburgh; Metropolitan Asylums Board; Mr. G. Mayall, Bolton; Medical Society of London, Registrar of; Capt. W. MacAdam, R.A.M.C.; Messrs. Macmillan and Co., Lond.; Dr. F. G. Miranda, Granada; Capt. C. R. McIntosh, R.A.M.C.; Messrs. May and Baker, Lond.; Dr. J. N. Matthews, Blackpool; Capt. A. Macdonald, R.A.M.C.; Mrs. I. E. Morison, Lond.; Manchester Royal Infirmary, General Supt. of; Mr. R. McKay, Lond.; Maruzen Co., Tokyo; Capt. T. McCririck, R.A.M.C.

N.—National Society for the Prevention of Cruelty to Children, Lond., Director of; North-East London Post-Graduate College, Dean of; National Food Economy League, Lond., Sec. of; *National Food Journal*.

O.—Mr. Y. Okura, Tokyo; Oldham Royal Infirmary, Supt. of; Dr. E. Odriozola, Lima; Sir Thomas Oliver; Col. M. D. O'Connell.

P.—Pictorial Publishing Co., Lond; Messrs. F. J. Parsons, Hastings; Patent Office, Lond., Librarian of; Mrs. Pilcher, Lond.; Mr. C. H. W. Parkinson, Fareham; Public Library, South Bend, U.S.A., Asst. Librarian of; Major G. N. Pitt, R.A.M.C.(T.); Dr. A. C. A. Packman, Rochester; Prince of Wales's General Hospital, Tottenham, Director of; Mr. J. E. Purvis, Cambridge; Major J. F. Porter, R.A.M.C.

Q.—Mr. R. Quesada, Edinburgh.

R.—Fleet-Surg. S. T. Reid, R.N.; Mr. P. B. Roth, Lond.; R. C. M.; Dr. E. D. Rowland, Georgetown, Demerara; Registrar-General; Dr. J. Regnault, Toulon; Rochester and Chatham Printing Co., Rochester; Mr. J. H. Rodgers, Bromley.

S.—Capt. A. H. Style, R.A.M.C.; Dr. R. H. Steen, Dartford; Mr. H. Sewaki, Tokio; St. Bartholomew's, Rochester, Sec. of; Sheffield Royal Infirmary, Sec. of; Messrs. Spiers and Pond, Lond.; Médecin-Major J. A. Sicard; Messrs. G. Street and Co., Lond.; St. Andrew's Hospital, Northampton, Sec. of; Dr. G. Sanders, Keith; Dr. W. S. Smith, Chadwell Heath; Stadt-Bibliothek, Bern; Salford Royal Hospital, Sec. of.

T.—Mr. L. Thain, Rwyas Harold; Dr. H. H. Tidswell, Torquay; Sir StClair Thomson, Lond.; Mr. Y. Tagami, Tokio; *The Times*, Lond.

U.—Major W. H. Unwin, N.Z.M.C.; University College, Reading, Librarian of.

W.—Dr. F. F. Wynekoop, Chicago; Capt. E. Williams, R.A.M.C.; Capt. J. C. Walker, R.A.M.C.; Capt. W. Williams, R.A.M.C.; Worker's Educational Association, Manchester, Sec. to; Mrs. Warren, Greenford; Lieut.-Col. A. E. Webb-Johnson, D.S.O., R.A.M.C.; Dr. H. Waldo, Clifton; Mr. S. Whitman, Lond.; Messrs. W. Wood and Co., New York; Capt. J. B. Whitfield, R.A.M.C.; Dr. F. J. Woollacott, Lond.; Walsall and District Hospital, Walsall, Sec. of; Messrs. A. Wood, Campbell, and Co., Lond.; Whitehaven Corporation, Town Clerk of; West London Hospital Post Graduate College, Dean of; *Walsall Observer*, Proprietors of; Mr. E. S. Weymouth, Lond.

Y.—Lieut.-Col. A. C. Yate.

Letters, each with enclosure, are also acknowledged from—

A—Ancoats Hospital, Manchester, Sec. of; A. G.; A. W. T.; Dr. F. S. Arnold, Berkhamsted; Mr. E. Arnold, Lond.

B.—Dr. L. T. Burra, Little Kimble; Beckett Hospital, Barnsley, Sec. of; *Bodmin Guardian*, Manager of; Berkshire County Council, Reading, Treas. to the; Messrs. W. H. Bailey and Son, Lond.; Mr. J. G. Bissett, Aberdeen; Messrs. Burroughs Wellcome and Co., Lond.; Birkenhead Guardians, Clerk to the; Belfast Corporation, Chamberlain to the; Capt. C. Banks, R.A.M.C.; Bradford Corporation, Treas. to the; Brighton Corporation, Treas. to the.

C.—Dr. J. Cates, St. Helens; Messrs. J. and A. Carter, Lond.; Capt. C. J. W. Clayton, R.A.M.C.; Messrs. T. Christy and Co., Lond.; Coventry Education Committee, Sec. of; Colmonell Parish Council, Inspector of; Messrs. Clarke, Son, and Platt, Lond.; C. E. B.

D.—Dr. G. Donald, Edinburgh; Capt. F. Dillon, R.A.M.C.; Messrs. De St. Dalmas and Co., Leicester; Durham County Council Education Committee, Sec. of.

E.—Mr. P. O. Ellison, Lond.; Mr. W. Easton, Jedburgh; A. A. M.

F.—Capt. S. Fenwick, R.A.M.C.

G.—Capt. N. Graham, R.A.M.C.; Dr. S. Gill, Formby; G. M. J.; Mr. H. W. Gemmell, Newport; Lieut.-Col. C. H. Gilmour, C.A.M.C.; Messrs. Grantoff, Bride, and Co., Lond.; Messrs. Garland, Smith, and Co., Lond.; Guest Hospital, Dudley, Sec. of; Messrs. Godsell and Barnett-Smith, Lond.

H.—Miss K. Heanley, St. Ives; Dr. W. N. Heard, Parkstone; Messrs. J. Heywood, Manchester; Messrs. C. J. Hewlett and Co., Lond.; Dr. T. E. Hill, Durham; Messrs. Hannay and Hannay, South Shields.

I.—Mr. R. B. Ince, Jarvis Brook.

K.—Messrs. G. Kelly and Co., Lond.

L.—Capt. C. Lundie, R.A.M.C.; Dr. J. Love, Gormanston; Leicester Royal Infirmary, Sec. of.

M.—Lieut.-Col. MacLoughlin, Manchester Guardians, Clerk to the; Mrs. Myers, Cambridge; Capt. H. T. Marris, R.A.M.C.; Medical Research Committee, Lond., Sec. of; Messrs. Mather and Crowther, Lond.; Milton Advertising Agency, Lond.

N.—New Mental Nurses' Co-operation, Lond.; Nottingham and Midland Eye Infirmary, Sec. of.

O.—Oxford Eye Hospital, Sec. of; Ochil Hills Sanatorium, Millnathort, Sec. of; Dr. S. Otake, Lond.

P.—Lieut. P. L. Pollard, R.A.M.C.; Preston Corporation, Treas. to the.

R.—Mr. D. Richmond, Rochdale; Capt. G. D. Robertson, R.A.M.C.

S.—Surg. J. A. B. Snell, R.N.; Messrs. Saward, Baker, and Co., Lond.; Scholastic, Clerical, & Association, Lond., Sec. of; Surgical Manufacturing Co., Lond.

T.—Lieut. W. Templeton, R.A.M.C.

V.—Messrs. Van Houten, Lond.

W.—Mr. T. F. Wyse, Margate; Dr. Williams, Newcastle-on-Tyne; Miss A. White, Sheffield; Messrs. Willing, Lond.; Mrs. R. Warren, Lond.; Mr. F. Wilson, Lond.; Mrs. Webb, Lond.